WIRE AND WIRE PRODUCTS

Consider
MORGAN CONNOR
WIRE MACHINES
in your plans for the future

June 19 49

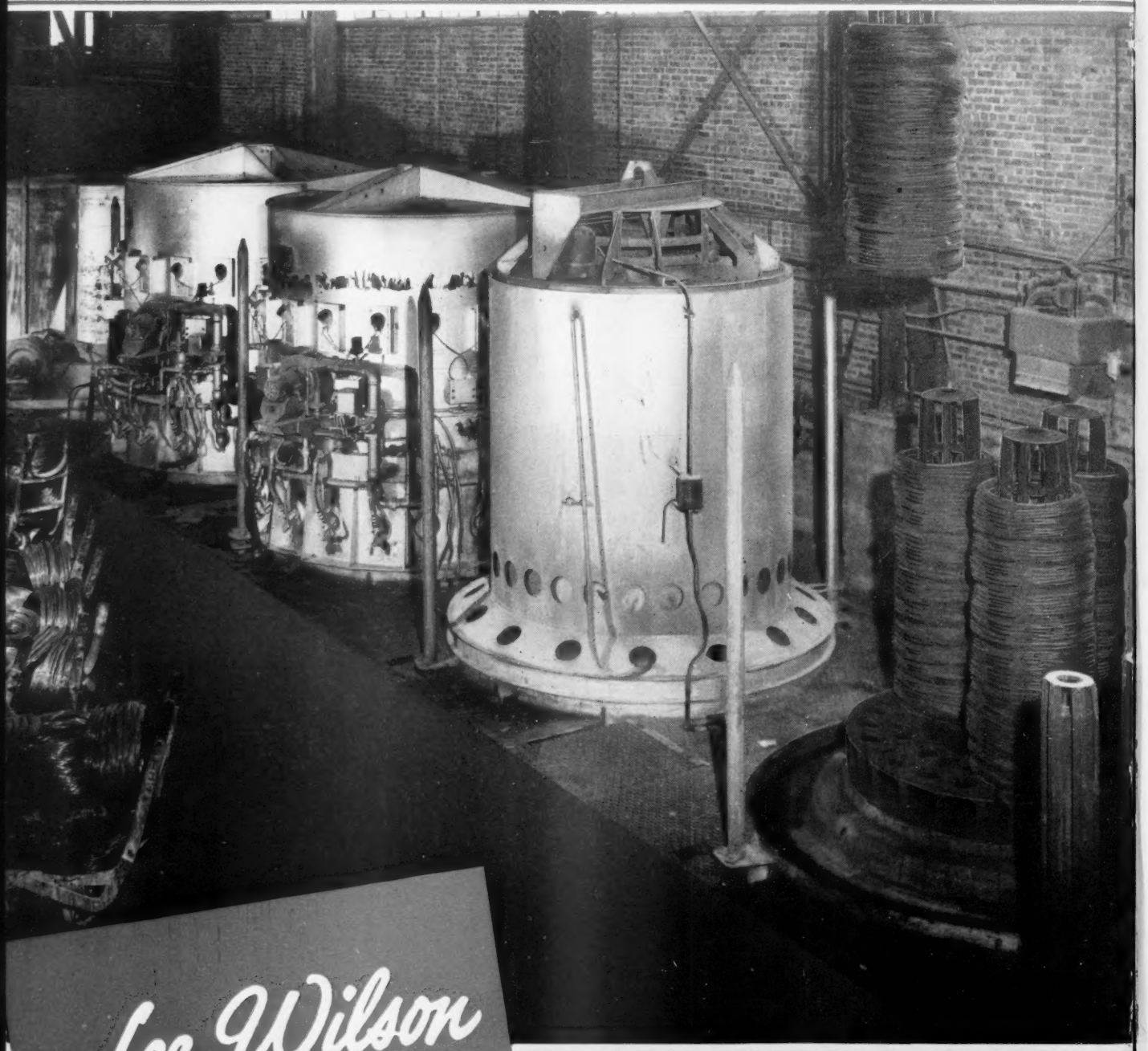
MORGAN CONSTRUCTION COMPANY • WORCESTER, MASSACHUSETTS

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

V 24/6 JE 49 UMI

WILSON Wire Annealing at NORTHWESTERN STEEL & WIRE CO.

STERLING, ILL.



Lee Wilson

ENGINEERING Co., Inc.

20005 WEST LAKE ROAD • CLEVELAND, OHIO

Telephone ACademy 4670

INDUSTRIAL FURNACES ★ RADIANT TUBE HEATING ★ HEAT TREATING PROCESSES

Better for the LONG PULL

WEAR-RESISTANT CARBOLOY GIVES LONGER DIE LIFE... FASTER PRODUCTION...UNIFORM CLOSE TOLERANCES

Standard mandrels and mandrel nibs

Standard square dies

Standard hex dies

Standard guide rings

Standard round-hole dies

Special shape dies

Does your production call for a wire draw die that can stand the gaff through long continuous runs . . . and still give you a top-quality product?

Then your answer is a die of Carboloy Cemented Carbide—the hardest metal made by man.

Wear-resistant Carboloy wire dies give extra-long life, hold uniform close tolerances on long, tough runs, mean fewer rejects . . . and *lower cost per ton.*

But that's only *part* of the story. Carboloy's extra-hardness permits higher drawing speed and continuous production. And you get greater tonnage per die, less downtime for die servicing.

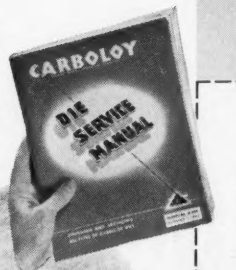
It all adds up to better quality at lower cost . . . and isn't that what interests you most these days?

Dies to fit your job

In Carboloy's complete line you'll find "standards" in a wide range of sizes and shapes, with fast deliveries from conveniently located stocks. Or—if yours is a special problem—Carboloy engineers will work with you in providing just the right die for your job.

There's no time like *right now* to start getting the longer die life and other advantages wear-resistant Carboloy dies offer you Write today for the FREE Carboloy Die Service Manual that tells the full story of Carboloy dies.

CARBOLOY COMPANY, INC.
11171 E. 8 Mile Road, Detroit 32, Michigan



YOU CAN'T BEAT CARBOLOY ON THE DRAW!

CARBOLOY®

CEMENTED CARBIDE

WEAR-RESISTANT WIRE DIES

CARBOLOY COMPANY, INC.
11171 E. 8 Mile Road, Detroit 32, Michigan

Gentlemen:
Please send me your Carboloy Die Service Manual (D-119) giving complete information on how Carboloy dies can give us better quality at lower cost.

NAME_____

TITLE_____ COMPANY_____

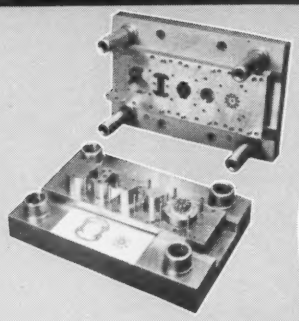
STREET_____

CITY_____ ZONE_____ STATE_____

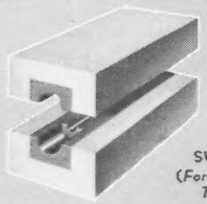
"50 Times Better"

Talide
(TUNGSTEN CARBIDE)
Drawing Dies

TALIDE METAL MEETS EVERY REQUIREMENT



PIERCING AND LAMINATION DIES



SWAGING DIES
(For Forming Solid and Tubular Shapes)

POWDER METALLURGY DIES *(For Compacting Powdered Metals and Materials)*

Talide Dies outwear steel dies 50 to 1. Production runs of over 1,000,000 pieces are commonly obtained. Long life of super-hard Talide Dies reduces down time, increases output, lowers unit cost and makes a better product.

Tungsten Carbide Dies take and hold a brilliant polish, thereby imparting a better finish to your product.

Talide Metal Dies range in size from pin point to 24" I. D., and in many complex shapes . . . used for blanking, drawing, swaging, extruding, spinning or curling.

Send us prints or parts for estimate and recommendations and ask for Catalog 48-WP.

BLANKING AND FORMING DIES
(For Stamping Lamination Discs, Metals, Plastics, Paper)

TUBE MANDRELS

HEADING AND EXTRUSION DIES
(For Shaping and Sizing Bolts, Nuts, Screws and Collapsible Tubes)

DRAWING DIES
(For Wire, Tubing and Bar Stock)

SPINNING AND CURLING ROLLERS

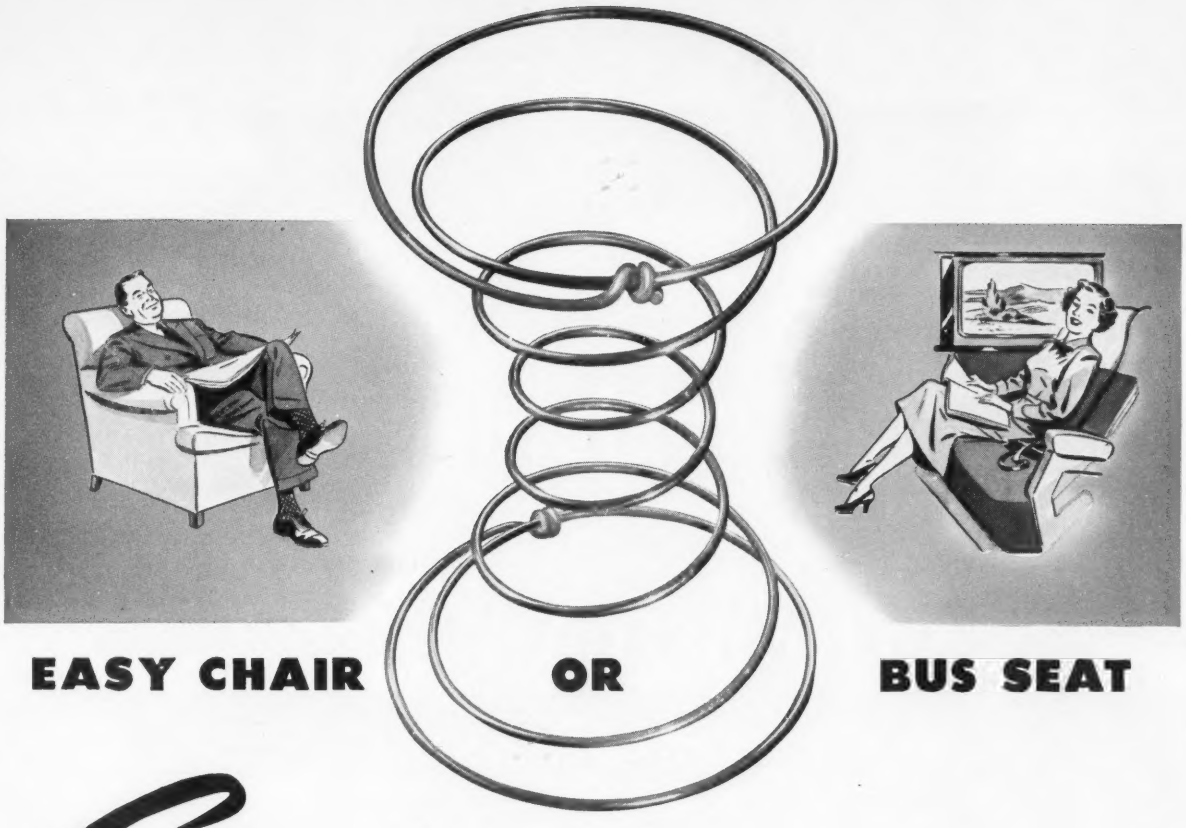
SINTERED CARBIDES
METAL CARBIDES CORPORATION
TALIDE
YOUNGSTOWN, OHIO
HOT PRESSED CARBIDES

METAL CARBIDES CORPORATION

YOUNGSTOWN 5, OHIO *Pioneers in Tungsten Carbide Metallurgy*

CUTTING TOOLS · DRAWING DIES · WEAR RESISTANT PARTS

WIRE & WIRE PRODUCTS, Vol. 24, No. 6, June, 1949. Publication Office, at One Sherman Ave., Jersey City 7, N. J. Executive Office, 300 Main Street, Stamford, Conn. Published monthly by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Secy. and Treas. Subscription price: U. S. $5.00; Canada, $5.00 per year; 50 cents per copy; Foreign, $7.50 per year. Entered as second class matter, January 10, 1949, at the Post Office, Jersey City, N. J., under Act of March 3, 1879.



EASY CHAIR OR BUS SEAT

Good springs mean

COMFORT · DURABILITY · ECONOMY

And by "good springs" we mean of course, springs made from a high-quality steel like Silver Star Spring Wire. This is Bethlehem's special-analysis, high-carbon wire engineered *solely* for upholstery spring applications.

Leading manufacturers have used it for years. They specify it for bedding, innerspring units, upholstered chairs, box springs . . . seats for automobiles, buses, theatres . . . and other uses where well-designed steel springs provide the ultimate in comfort, long life, and economy.

Silver Star Spring Wire meets the requirements for upholstery spring designs. It coils and knots readily. It's uniform in temper, gauge and physical properties Made in a complete range of sizes, Silver Star is carefully processed in our modern wire mills.

Right now is a good time to let us work with you. Ask for complete information from your nearest Bethlehem sales office or write us at Bethlehem. The most convincing proof of Silver Star's high quality is to use it in your products.

BETHLEHEM STEEL

Silver Star SPRING WIRE BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

DO YOU KNOW

NEW

barn cable designs

USE

FIBERGLAS* *Yarns*

AS A JACKET COMPONENT

AND AS TENSION MEMBERS

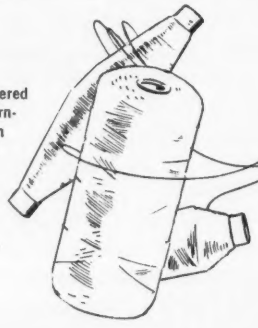
FIBERGLAS LOW COST 150's GLASS YARNS

DON'T ROT DON'T ABSORB MOISTURE

FLAMEPROOF RESIST CORROSIVE VAPORS

HIGH TENSILE STRENGTH PROVIDES HIGH IMPACT STRENGTH

MINIMUM AND STABLE DIMENSIONS FOR PRODUCTION EFFICIENCY AND ECONOMY



*Fiberglas is the registered trade-mark of Owens-Corning Fiberglas Corporation for a variety of products made of or with glass fibers

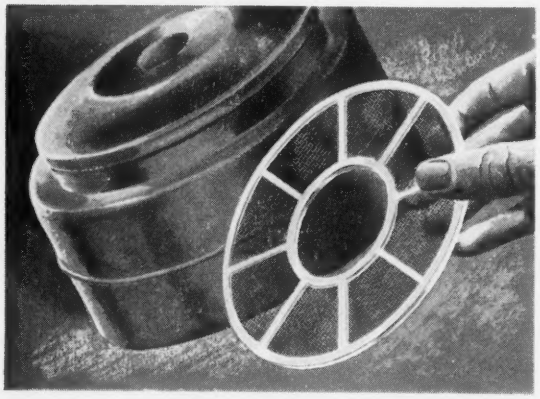
OWENS-CORNING FIBERGLAS *Yarns*

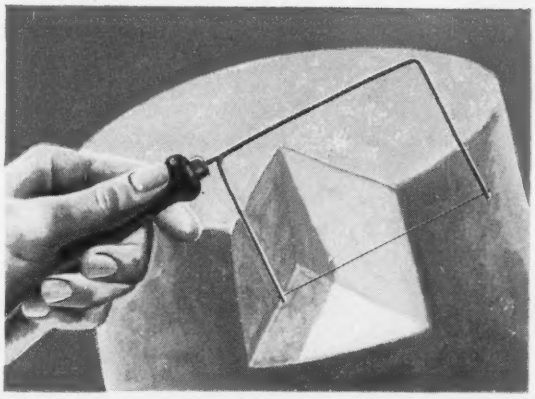
OWENS-CORNING FIBERGLAS CORPORATION, TEXTILE PRODUCTS DIVISION, DEPT. 875, N. Y. 22, N. Y.

IN CANADA, FIBERGLAS CANADA LTD., TORONTO, ONTARIO

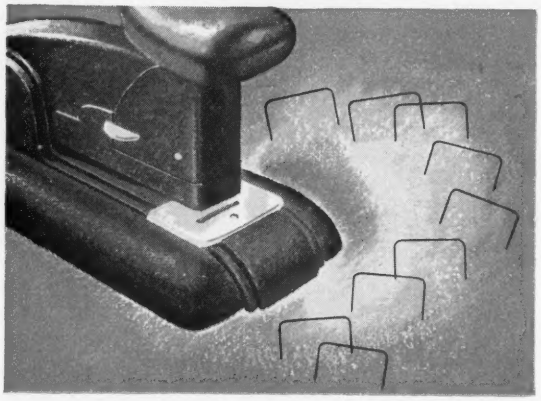
Fiberglas yarns offer the same advantages when used in building wire

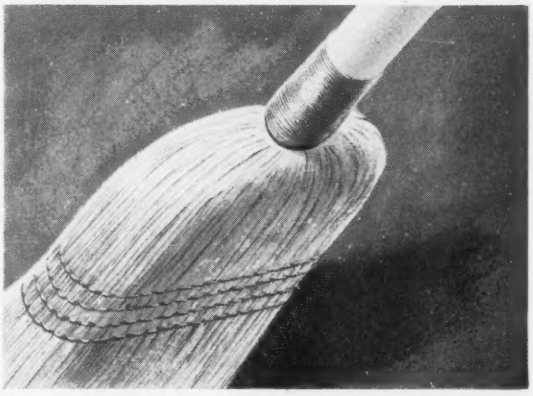
use U·S·S Amerfine





. . . for products like these





THESE drawings point out just a few of the many possible applications of U·S·S Amerfine. For this versatile wire is tailored for use in every product that requires fine wire.

For engine air filters . . . brooms . . . brushes . . . staples . . . vegetable strainers . . . butter cutters, you'll find U·S·S Amerfine ideal.

We will draw Amerfine to fit your needs exactly. And we can supply it NOW in the mill quantities you need.

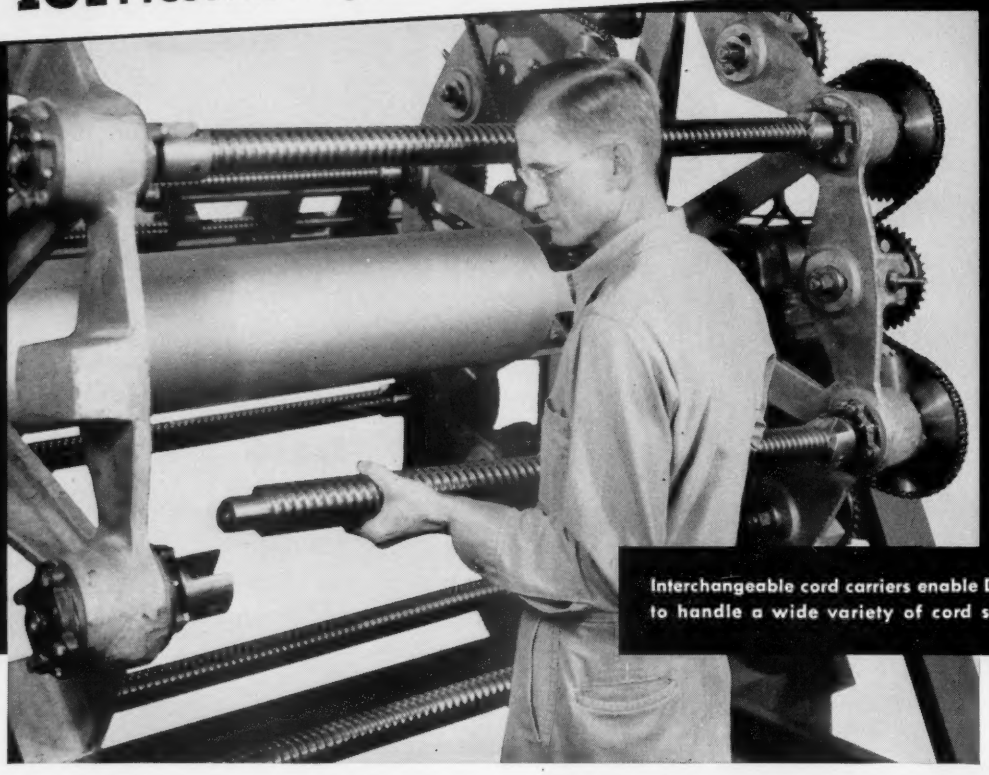
AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

If you use fine wire... use Amerfine

USS

UNITED STATES STEEL

For Better, Faster Rubber and Plastic Jacketing, IOI Presents... *The* SELF-ADVANCING-REEL *Cord Dryer*



Interchangeable cord carriers enable Dryer to handle a wide variety of cord sizes.

High wire scrap loss has long been the nemesis of most continuous rubber and plastic jacketing systems. Underlying cause has been hygroscopic moisture in cords or on the surface of bare conductors. This moisture is transformed into steam at the tuber die, causing blisters and cracks in the cord jacket, reducing insulating properties and destroying diameter control. It also causes substantial losses in production time and production speed.

To overcome this economic waste IOI has developed the Self-Advancing-Reel Cord Pre-Dryer which answers all the problems of drying, back-tensioning, easy threading and space saving in preparing cord for the tuber operation. Some of the outstanding features of this Dryer, demonstrated by units in operation, are listed at the right.

BASIC ADVANTAGES

- Increased Extrusion Speeds
- Blistering Eliminated
- Diameter Control Increased
- Improved Jacket Adhesion
- Reduced Scrap Loss

OPERATIONAL ADVANTAGES

- Threads Itself in 2 Minutes
- Uses Minimum Floor Space
- Automatic Temperature Control
- Automatic Tension Control
- Wide Diameter Range

Complete Information, engineering drawings and analyses of savings effected by this new Self-Advancing Reel Cord Dryer will be sent to you upon request... or an IOI engineer will call in person if you prefer.

EXTRUSION SYSTEMS • CONTINUOUS TAKEUPS
ENAMELING MACHINES • PROCESS ANNEALERS

CORD PRE-DRYERS • LACQUERING SYSTEMS
ASBESTOS INSULATING MACHINES

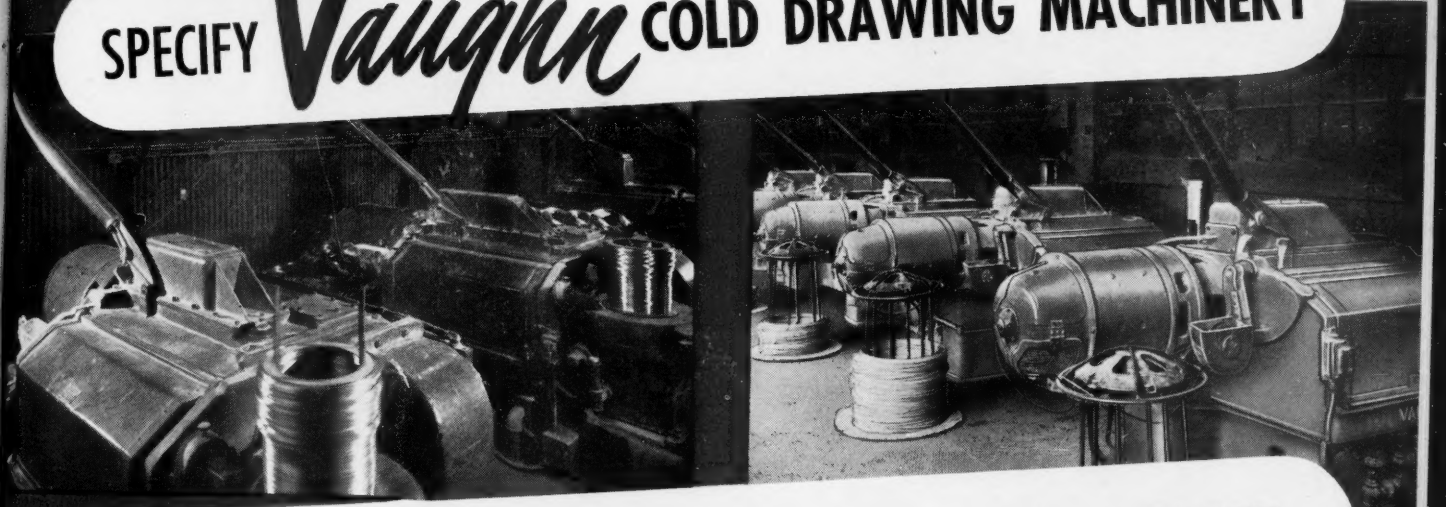
INDUSTRIAL OVENS, INC.

IOI ENGINEERING VERSATILITY

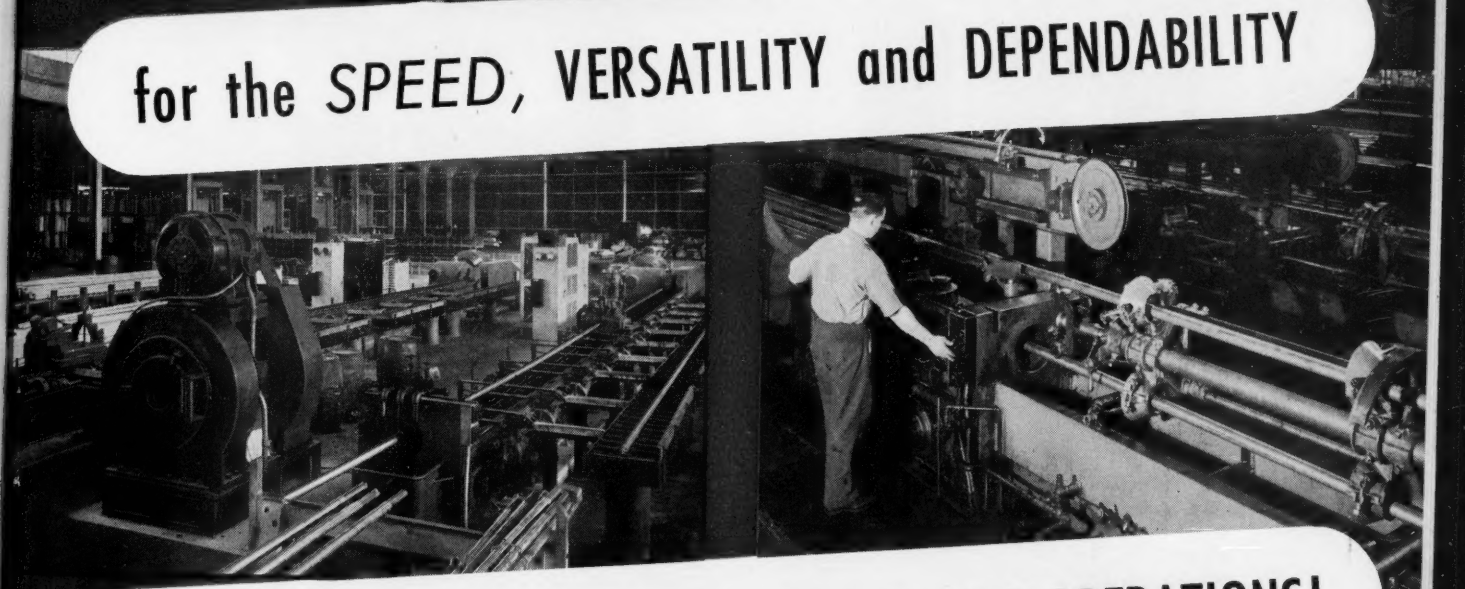
13825 TRISKETT ROAD CLEVELAND 11, OHIO

ASSOCIATED COMPANY: JAMES DAY MACHINERY LTD., LONDON W.1, ENGLAND

SPECIFY *Vaughn* COLD DRAWING MACHINERY



for the *SPEED*, VERSATILITY and DEPENDABILITY



that maintain CONSISTENTLY PROFITABLE OPERATIONS!

THE VAUGHN MACHINERY CO
BUTLER VALLEY, U. S. A.

COMPLETE COLD DRAWING EQUIPMENT ... for Single ...
Largest Bench ... for the ... Ferrous ...

"Quick on the Draw"
VAUGHN MACHINERY
PROFITABLY USED BY LEADING PRODUCERS SINCE 1871

ENAMELED COPPER	TWISTED MULTIPLIES	CELANESE COVERED
ENAMELED IRON	PARALLEL MULTIPLES	GLASS FIBRE COVERED
ENAMELED ALLOY	SILK COVERED	LITZENDRAHT AND
ENAMELED ALUMINUM	COTTON COVERED	SPECIALS TO ORDER

There's more to present day engineering and design problems than shortages of materials, priorities, etc. There is also the question of whether specifications have been rigidly adhered to. Wire, for example, must meet such requirements as specific electrical properties, flexibility, tensile strength, laying speed, uniformity, etc.

Whether it's a buyer's or seller's market, WINCO magnet wire products are drawn to exact specifications. Uniformity of product is guaranteed by mercury process tests and careful supervision guards against variations in consistency, structure or electrical values.

If you have a wire problem, our complete facilities are at your disposal. Send blueprints or specifications for recommendations, without obligation. Samples sent on request; write today.

WINSTED DIVISION

HUDSON WIRE COMPANY

WINSTED CONNECTICUT

America Needs '49ers

JUST a hundred years ago, the Forty-niners stormed the gold fields of California. They faced staggering obstacles, sure hardship, uncertain reward. Thousands failed, thousands of others realized modest gain, a few made fortunes. None sought or received help or direction from a benevolent government.

Now a century later, America faces another age of golden opportunity--an era when science and industry reveal new treasure to be had for the making. Turning today's visions into reality calls for '49ers--men of purpose and resolution, courage and independent spirit. You as a leader in your community may find a personal challenge and an inspiration in the Old '49er. By example and precept, you can help America toward her greatest accomplishments--in prosperity and peace.

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York

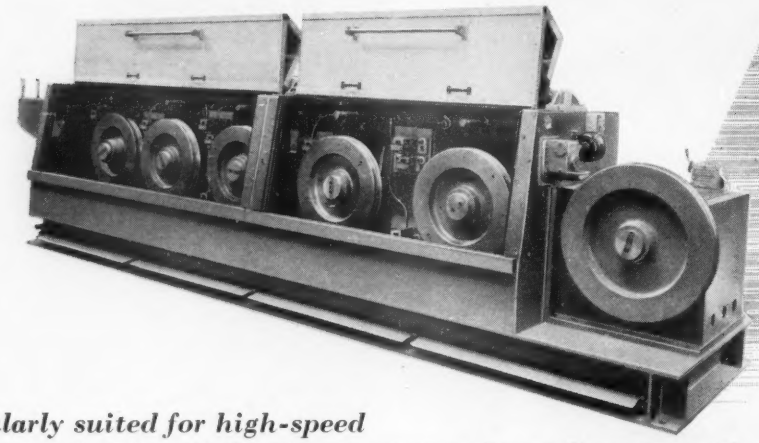
MANUFACTURERS OF CARBON, ALLOY AND YOLOY STEELS

ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES.

IT'S NEW!

SYNCRO

Heavy Duty, Continuous, Tandem Wire Drawing Machine For Heavy Rods



Particularly suited for high-speed continuous drawing of aluminum, copper, brass, bronze or other non-ferrous materials.

Incorporates any multiple of dies from 6 to 10.

Can be furnished with a vertical finishing block for a coiled product—or with conventional type of horizontal capstan for direct spooling.

Typical of all Syncro heavy duty machines, this wire drawing machine is rugged for day-in, day-out trouble-free operation.

Utilizes most efficient type of drive gearing so that power losses are reduced to a minimum.

It's all new—specially designed and built to meet the needs of the wire industry.

Standardize on Syncro Machinery For The Wire Industry

There's a standard Syncro Machine for every wire drawing need, from rod to fine wire — from strands to cable.

SYNCRO MACHINE COMPANY

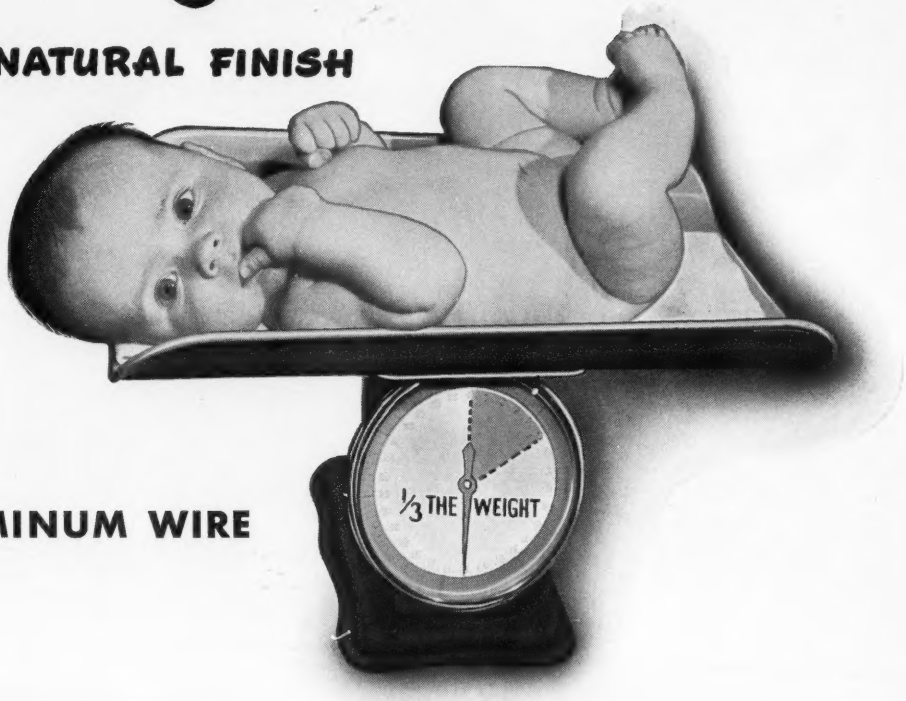
611 Sayre Avenue — Perth Amboy, N. J.

Affiliated Company

Winget-Syncro, Rochester, Kent, England

light-weight...

WITH NATURAL FINISH



ALCOA ALUMINUM WIRE

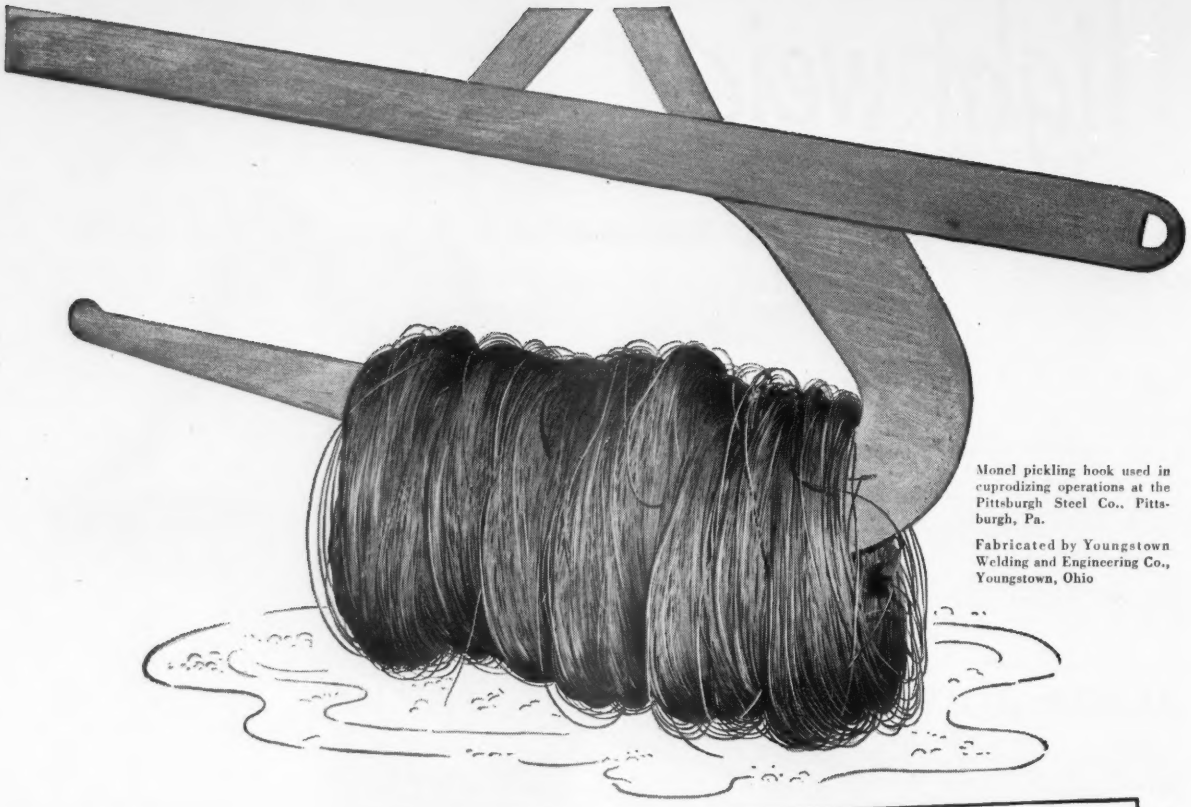
One-third the weight of steel or brass . . . endowed with a lustrous, *natural* finish . . . Alcoa Aluminum Wire is a prize "baby" for many sales-minded fabricators. Versatile aluminum wire products take any finish other metal products will take, *plus*, the patented Alumilite finish in any eye-catching color you choose.

You'll like the way Alcoa Aluminum Wire works on your machines. Its high tensile strength . . . economy (3 times as many feet of wire in a pound of aluminum as in a pound of the heavier metals). Our aluminum wire is made in a variety of alloys and tempers, in shapes and sizes to meet your requirements. ALUMINUM COMPANY OF AMERICA, 1828 Gulf Building, Pittsburgh 19, Pennsylvania.

Send for copies of "Alcoa Aluminum and Its Alloys", complete information and data on all Alcoa Aluminum Alloys, plus 64-page, four-color booklet, "Finishes for Alcoa Aluminum".

ALCOA FIRST IN ALUMINUM

INGOT • SHEET & PLATE • SHAPES, ROLLED & EXTRUDED • WIRE • ROD • BAR • TUBING • PIPE • SAND, DIE & PERMANENT MOLD CASTINGS • FORGINGS • IMPACT EXTRUSIONS
ELECTRICAL CONDUCTORS • SCREW MACHINE PRODUCTS • FABRICATED PRODUCTS • FASTENERS • FOIL • ALUMINUM PIGMENTS • MAGNESIUM PRODUCTS



Monel pickling hook used in cuprodizing operations at the Pittsburgh Steel Co., Pittsburgh, Pa.

Fabricated by Youngstown Welding and Engineering Co., Youngstown, Ohio

6 times longer life since switching to "Monel" Pickling Hooks!

Longer life is an old story to users of Monel* pickling equipment, **(over 40 years old in fact.)**

Pittsburgh Steel Company, too, found that out when they installed Monel pickling hooks to handle coils of steel wire.

Before turning to Monel, hooks of other materials had been tried. *Sulfuric acid and wire-coating chemicals ruined all of them within seven months!*

The Monel hooks, however, ended that problem. So far, they have outlasted the best of the others by six times, and are still in service after 3½ years.

Today, at Pittsburgh Steel, 14 Monel hooks are in operation, each handling payloads up to 2400 pounds.

"PICK" MONEL *for all types of pickling equipment. It can be fabricated to your needs out of economical, standard mill forms. For more information on Monel and Monel fabricators, write our Ray Reddell.*

*Reg. U. S. Pat. Off.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall St., New York 5, N. Y.

DESIGNERS and MANUFACTURERS! Sand castings and precision castings of Monel, Nickel, Inconel and other Nickel alloys are available from INCO's own foundry.

EMBLEM OF SERVICE INCO TRADE MARK

"MONEL*" Pickling Equipment means *Extra* CAPACITY . . . *Extra* LIFE . . . *Extra* SAFETY

What *is* YOUR Mortality Rate on Dies?

Photograph Courtesy
Firth Sterling Steel & Carbide Corp.

IF YOU are already using Magnus Metalcoat #267 for coating your rod and wire before drawing, you *know* how much longer your dies last than they used to. If you are not yet using #267, this will interest you.

The wire drawing die is called upon to do a very tough job, and it is built to stand up under tremendous tension and speed. Magnus Metalcoat #267 and the tungsten carbide die were "made for each other."

Yes, Metalcoat #267 is a downright life-saver for dies. It provides a coating which "cushions" the metal . . . s-t-r-e-t-c-h-e-s right along with it as it is drawn. When your lubricant is just right, not too rich, not too lean, your wire will be mighty easy on the draw.

Many of our customers have found that by using Metalcoat #267 in a heavier concentration, their die life has increased proportionately. Less upkeep of the solution is required, and they have a greater margin of safety within which to work, because the coating is heavier and provides even greater cushioning than before.

Increased die life is only one important advantage in using Metalcoat #267. Rust protection is another. You can coat your rod or wire *now* and draw it minutes later . . . *days* later . . . weeks later. The coating will still be there, protecting the metal from rust. And, as you already know, there is no liming or baking with #267.

Results are always uniform with this coating, because it is so carefully made that it never needs "doctoring" as so many others do. The method of using it is so simple, so easy, so economical, it will surprise you.

MAGNUS CHEMICAL CO., INC.
Metal Coating Division
188 South Avenue Garwood, N. J.

Write for our new booklet on the use of Magnus Metalcoat #267 for drawing High Carbon, Low Carbon, Copper-Coated and Stainless Steel Wire.

Remember to Specify
Fast-Cutting NORTON Discs!

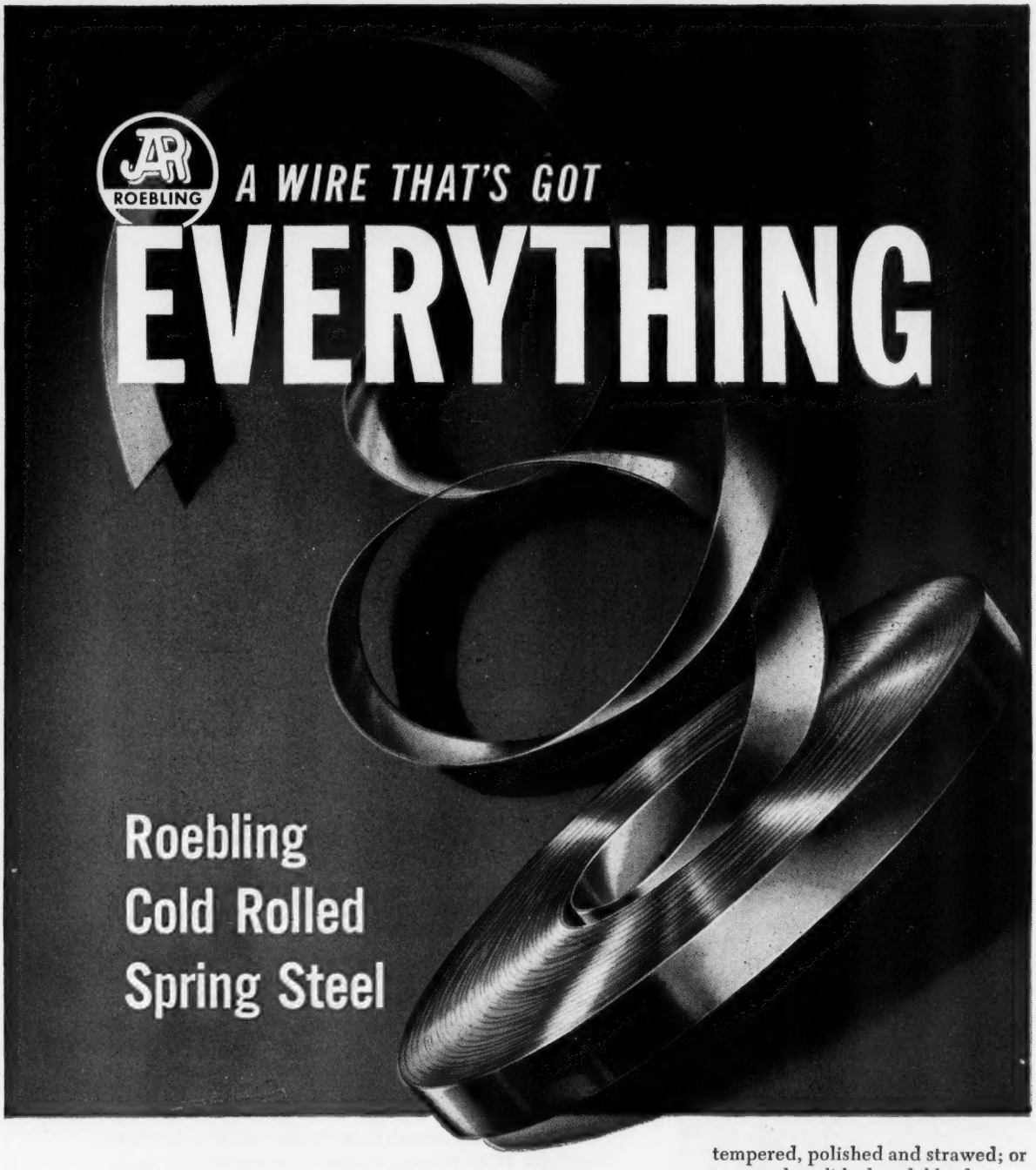
You can produce **more useable springs per hour for less** with Norton Discs, for they cut fast and cool without danger of burn, burr or distortion — stay flat and sharp and resist grooving — are unaffected by age or moisture — and require a minimum of dressing.
Popular for most spring grinding operations are Norton Discs of tough, sharp 57 ALUNDUM abrasive or the sensational 32 ALUNDUM abrasive (Regular or Open Structure) with vitrified bond. They're available in all standard sizes (15″ to 72″ in diameter), and with all types of mountings (including plate-mounted and inserted-nut). See your Norton abrasive engineer or distributor for exact specifications and further details.

NORTON COMPANY • WORCESTER 6, MASS.

Distributors In All Principal Cities — Consult Your Classified Telephone Directory

W–1241

NORTON® ABRASIVES



QUALITY THAT BRINGS ECONOMY

YOU KNOW what happens when you use wire uniform in gauge, grain, analysis, temper and finish. You save time and money... production goes up . . . stoppages and rejects come down. And those are the reasons why more and more manufacturers are adopting Roebling Cold Rolled Spring Steel.

With carbon content above 0.40%, you can now get Roebling Cold Rolled annealed and hard rolled untempered in bright finish. In the higher carbon ranges it is available tempered, in scaleless tempered; tempered and polished; tempered, polished and strawed; or tempered, polished and blued.

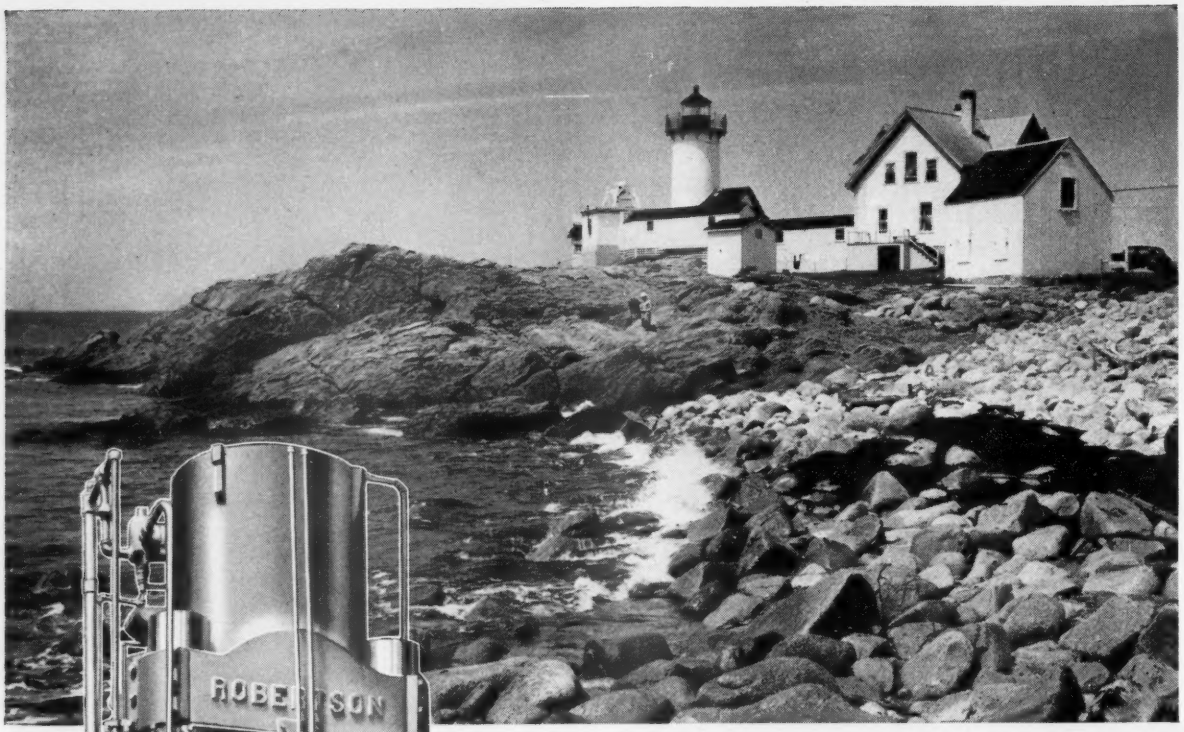
Have your Roebling representative help you select the *right* cold rolled spring steel, or round or shaped wire, for outstanding performance and worthwhile economy on your production lines and in your products. John A. Roebling's Sons Company, Trenton 2, New Jersey.

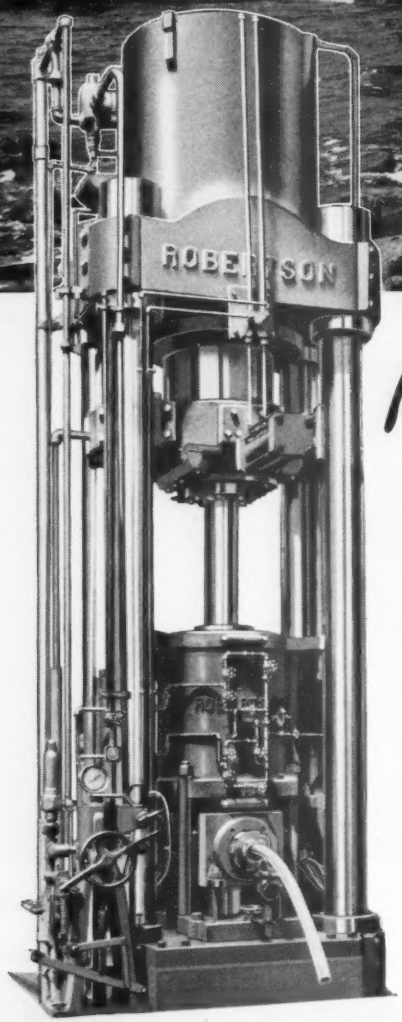
WRITE OR CALL THE ROEBLING REPRESENTATIVE AT YOUR NEAREST ROEBLING OFFICE AND WAREHOUSE

Atlanta, 934 Avon Ave. ★ ***Boston,*** 51 Sleeper St. ★ ***Chicago,*** 5525 W. Roosevelt Rd. ★ ***Cleveland,*** 701 St. Clair Ave., N. E. ★ ***Denver,*** 1635 17th St. ★ ***Houston,*** 6216 Navigation Blvd. ★ ***Los Angeles,*** 216 S. Alameda St. ★ ***New York,*** 19 Rector St. ★ ***Philadelphia,*** 12 S. 12th St. ★ ***Pittsburgh,*** 855 W. North Ave. ★ ***Portland, Ore.,*** 1032 N. W. 14th Ave. ★ ***San Francisco,*** 1740 17th St. ★ ***Seattle,*** 900 First Ave.

ROEBLING

☆ *A CENTURY OF CONFIDENCE* ☆





Proven Dependability

The rise and fall of the Tide is certainly beyond question. Throughout countless years, it is a symbol of the ultimate in *dependability*. Although no man-made machine will ever rival nature's Tides for sheer infallibility, machines are available that render an unusually high degree of *dependability*—The Robertson Lead Encasing Press is one of these.

Many of the leading manufacturers of Lead Encased Cable have found that this machine consistently produces with minimum maintenance cost through severe production schedules over a long period of years.

The proven dependability of Robertson machines is the end result of over 90 years' experience, plus superior craftsmanship, quality materials and parts, and precision in design and manufacture.

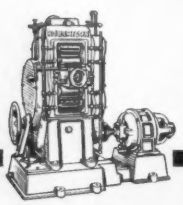
Other Robertson Products are: Hydraulic Pumps, Lead Melting Pots and Furnaces, Lead Sheath Stripping Machines, Dies, and High Pressure Hydraulic Equipment for *special uses*. Write for literature and further information.

JOHN Robertson
COMPANY INCORPORATED

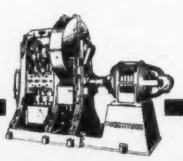
125-137 **WATER STREET, BROOKLYN 1, NEW YORK**

Designers and Builders of all Types of Lead Encasing Machinery

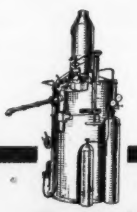
Since 1858



Lead Sheath Stripping Machine



Hydraulic Pump



Closed Lead Melting Pot

STANDARD *prepares its Lubricants to meet your own particular "Tastes" . . .*

Like a skilled chef prepares a special dish to please the palate of his patron, STANDARD service engineers and lab technicians are constantly at work producing wire drawing lubricants to meet the special (and exacting) requirements of wire mills everywhere!

When you're faced with a production headache involving the use of wire drawing lubricants, we'd like you to know that we're ready, willing and able to come up with a "chef's delight" to please the palate of your most temperamental and troublesome wire drawing problem!

For better wire drawing compounds and faster, better draws, call or write lubrication headquarters or any of our service centers listed below . . .

Standard's wire drawing compounds will produce the finish you require on all grades of steel, copper, or brass: — lime bright, extra bright, dull-coated; or special finishes for welding, lacquering, enamelling or plating.

STANDARD SERVICE CENTERS

INDUSTRIAL COMPOUNDS CO.
C. R. Mebl, Presidens
2037 Sacramento Blvd,
Los Angeles 21, California

INDUSTRIAL COMPOUNDS CO.
C. R. Mebl, Presidens
2425 Seventeenth Street
San Francisco, California

STANDARD INDUSTRIAL COMPOUNDS COMPANY
R. M. Conway
Millbury, Masspchusetts

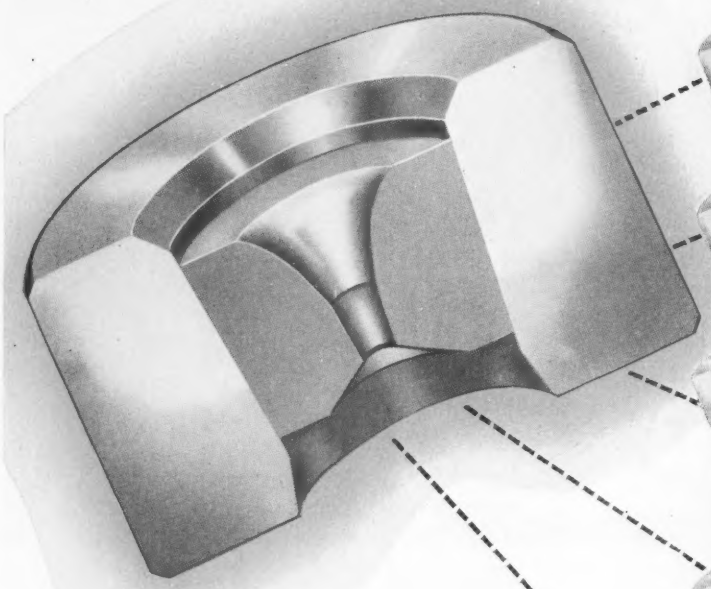
WIRE DRAWING LUBRICANTS

Standard

INDUSTRIAL COMPOUNDS CO.

4600 WEST FERDINAND STREET
• CHICAGO 44, ILLINOIS •

NOT *One* but *Five* FIRSTS
make V-R Carbide Dies Foremost in industry!



First in producing the only Tantalum-Tungsten Carbide developed specifically for Drawing Dies.

First to develop extra wide tapered front and back openings for easy inspection and maintenance. No steel to cut when resizing or refinishing V-R Dies.

First to design and develop the tapered nib construction increasing internal strength and providing perfect die concentricity.

First to manufacture Carbide Die with preformed rough cored back relief to eliminate costly die room coring operations over the entire range of hole sizes.

First to furnish Carbide Dies rough cored to finish, at hole sizes below .015". These rough cored dies are available in dies sizes R-0, R-1, and R-3, rough cored at .004" and .010".

Industrial progress depends upon new materials, designs, developments, and services.

Vascoloy-Ramet furnishes them all Five with every V-R Carbide Die.

PHONE
Your Nearest V-R Branch Office for Your Carbide Die Needs Now!

V-R Carbide Tools - Blanks - Dies • Tantung Cast Alloy Tools - Precision Castings • Bulldog Toolholders - Blades - Inserts

V-R CARBIDE and TANTUNG

vascoloy-ramet corporation

WAUKEGAN • ILLINOIS

The Wire Outlook

Businessmen would like to know just where we are and toward what we are heading. Even steel markets have become spotty and those big backlogs that were going to take until Fall to work off will not be suffering from overweight by the start of the third quarter.

Many rod buyers who were turning handsprings to get supplies earlier in the year are now reporting that they are readily available. At least one large wire mill has cut back production schedules by 20% for lack of orders. Competition for business is becoming keen, and vigorous selling tactics are everywhere evident.

Three steel mills recently abandoned the F.O.B. pricing system on many items and have reverted to a basing point status to meet competition. Buyers are slow in placing commitments in view of the unsettled price situation, yet third quarter commitments are essential, if steel production at a high level is to be continued.

It should be noted, however, that up to this point basic steel prices have in the main held unchanged. The many reductions announced have involved the cancellation of charges for extras, premiums, and such savings as have resulted from supply cost reductions that could be passed along to customers. Such reductions, however, have resulted in a welcome aggregate drop in the cost of steel to consumers.

The downward adjustment of prices, most observers believe, will shortly have been completed. Should this become evident, it is highly likely that an influx of orders will start to replenish depleted inventories. Against this probability, one electrical equipment manufacturer, who has been operating on a curtailed schedule for many months, has announced a return to capacity production in June. There is a point below which prices cannot go and have a business remain solvent. It is our belief that that point has about been reached.

The government is planning new spending programs that one Federal Reserve Bank official believes may convert the present slump into a new boom, but we are warned that dependence solely upon government pump-priming may result in another and longer depression. A healthier situation would result from a curtailment of public expenditures and a reduction of the tax burden to unleash that vast potential of consumption that would arise from increased private buying ability.

In the face of reduced production and increasing layoffs, labor leaders are girding their unions to seek a fourth round of wage increases and further social benefits. Such demands are untimely, unwise and unjustified, and would, if successful, only complicate our efforts to get the economic ship of state moving forward on an even keel. Rather, their efforts should be to educate their members to the need for greater production. Then consumer prices could be reduced with benefit to all—including labor.

Demand for wire and wire products for automotive production is holding better than for other consumer industries. Most users of wire are drawing upon inventories and allocations have lost much of their meaning. There has been a seasonal improvement in the demand for merchant wire products, particularly for fence and nails for housing. Our building construction bill for 1949 will run 18 billions, about 5% under 1948, but still big enough to call for a lot of electric wire, nails, screening and other items.

High carbon, spring and bedding wire requirements have slackened. Bolt and nut wire is showing some improvement, although the call for this wire is not over-active. Backlogs of bolt and nut makers are running an average of five weeks against five months a year ago.

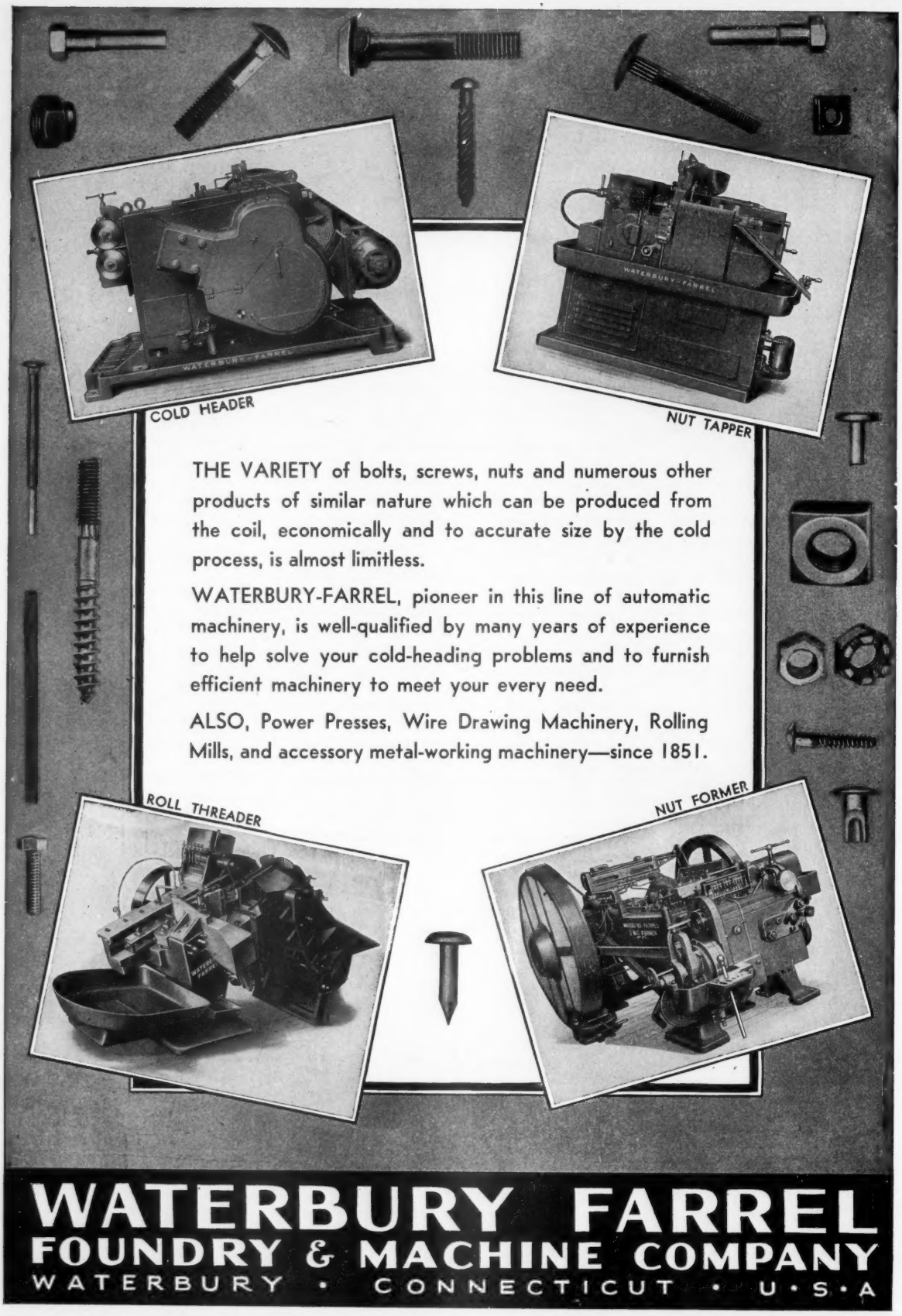
In contrast to the lessening demand for steel products, manufacturers of steel mill equipment are operating at a high level with backlogs running well into 1950. Deliveries of leading manufacturers are reported running from 9 to 14 months.

Scrap prices have stiffened with suppliers' growing indifference to orders, but few takers have resulted from the leveling off.

Probably the most unsettling factor in current buyer apathy has been non-ferrous metal price dips. Highly desirable in the long run, the continued slide has made consumers unwilling to be caught with high-priced metal on their hands. It is this factor, particularly on copper, that has helped to slow down copper wire, brass and electric wire and cable plants to so low an ebb.

Opinions vary as to when the tide will turn. It is unlikely that any marked up-trend will be noted before September; nevertheless, the post-war appetite for goods has not been filled and as long as men want jobs and need goods, the tendency will be toward better business from the moment any semblance of stability in prices is achieved.

—from the Editor's Desk


COLD HEADER
NUT TAPPER
THE VARIETY of bolts, screws, nuts and numerous other products of similar nature which can be produced from the coil, economically and to accurate size by the cold process, is almost limitless.
WATERBURY-FARREL, pioneer in this line of automatic machinery, is well-qualified by many years of experience to help solve your cold-heading problems and to furnish efficient machinery to meet your every need.
ALSO, Power Presses, Wire Drawing Machinery, Rolling Mills, and accessory metal-working machinery—since 1851.
ROLL THREADER
NUT FORMER
WATERBURY FARREL
FOUNDRY & MACHINE COMPANY
WATERBURY • CONNECTICUT • U·S·A

WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 24 JUNE, 1949 No. 6

Designated as
Official Publication By The Wire Association

Contents

Editor's Desk 487

A Mechanical Test to Measure the Workability of Wire
by W. Chubb, Jr., and Dr. D. S. Eppelsheimer 491

Aluminum Wire—Section IV—Heat Treatments of Aluminum Alloy Wire
by D. C. G. Lees 494

Static vs Dynamic Test Methods—Paper II
by Dr. John N. Kenyon 498

Materials Handling in the Wire Industry 502

Diamond-Powders and Wire Die Finish
by E. J. Schneider 504

The Manufacture of Coil Springs Under Completely Mechanized Conditions 506

Wire Association Activities 507

Wire Association 1949 Convention Program 509-512

Government Wire Production Information 513

Oustanding Personalities of the Wire Industry 516

A Review of Recent Wire Patents 522

Index to Advertisers 547

Where-to-Buy 548-552

WIRE and WIRE PRODUCTS is indexed regularly by Engineering Index, Inc., New York, N. Y.

— ASSOCIATE EDITORS —

Kenneth B. Lewis, Consulting Wire Mill Engineer

Lancaster, Allwine & Rommel, Consultants on Patent Information

Richard E. Brown, General Manager
R. S. Spengel, Business Manager
E. D. Sickels, Advertising Manager

Publication Office: Jersey City, N. J.
Executive Office: Stamford Trust Co. Bldg., 300 Main St., Stamford, Conn.

Annual Subscription, U. S. $5.00, Canada $5.00
50 Cents a Copy in U. S. Issued Monthly Foreign $7.50
October Convention Issue $1.00 a Copy
January Convention Discussions Issue $1.00 a Copy

Copyright 1949, Quinn-Brown Publishing Corp. WIRE AND WIRE PRODUCTS is fully protected by copyright and nothing that appears in it may be reprinted wholly or in part without permission.

NILES

"Reinforced Type"

FLANGED STEEL TRAVERSES

for wire and cable

. . . have extra strength where it is needed most—at bolt holes and base of the flange. This reinforcing makes possible the use of lighter gauge steel, saving up to 20% in weight while increasing overall strength.

Niles Flanged Steel Traverses have given as much as sixteen years' service without refinishing or major maintenance, according to actual experience records. In many cases their use has doubled the number of trips per reel before cut downs or scrapping of wooden heads.

They are manufactured in sizes up to 56" diameter and 48" traverse —in plain, painted or hot dip galvanized finishes—as light as 18-gauge steel. Width of flange and number of bolt and drain holes are furnished to your specifications. Available for prompt delivery. Write for prices.

• • •

Manufactured Under License Arrangements With Western Electric Co., Inc.

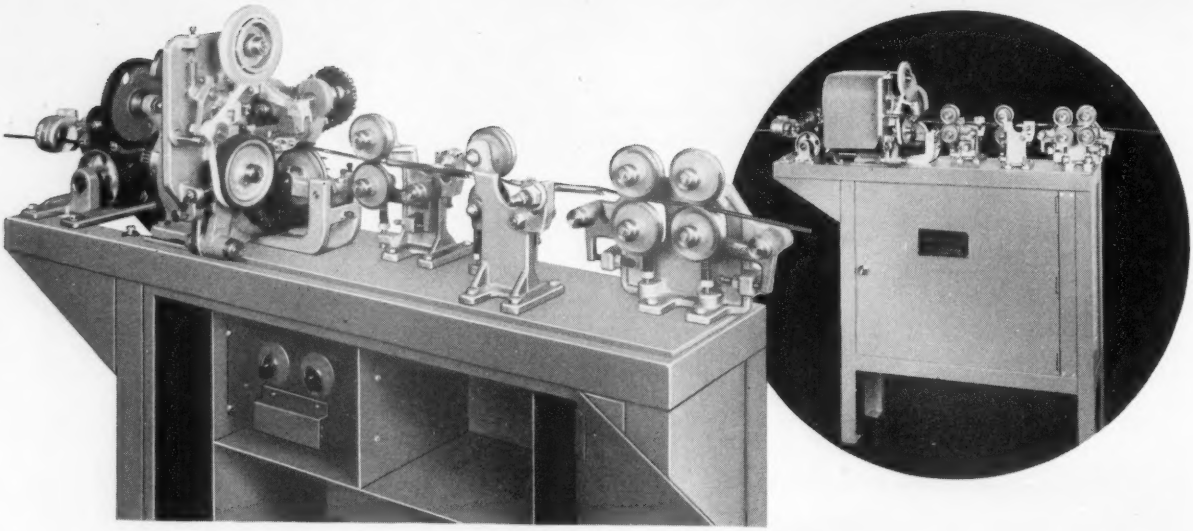
REPUBLIC STEEL

NILES STEEL PRODUCTS DIVISION

REPUBLIC STEEL CORPORATION

NILES • OHIO

Type AC
WIRE LABELLING MACHINE
For Labelling Power Supply Cords and Cord Sets



Only 15 Minutes a Day

Required of an operator to load, regulate and check operation of machine.

Will apply one label only to a Cord Set or Power Supply Cord automatically at any desired position on cut lengths of cord, regardless of length, when used in conjunction with a Cutting and Stripping Machine.

The machine applies Pressure-Sensitive, Underwriters Approval Labels, which have the complete endorsement of all electrical appliance manufacturers answering a recent Pressure Sensitive Label questionnaire.

Wire labelling with the JLE Type AC Machine is cheaper by far than other methods of Cord Set or Power Supply Cord labelling.

JAMES L. ENTWISTLE CO.
43 CHURCH STREET, PAWTUCKET, RHODE ISLAND

30 YEARS OF SERVICE TO THE WIRE INDUSTRY

Canadian Representatives:
THE A. R. WILLIAMS MACH. CO., LTD.
64 FRONT ST. W.
TORONTO, ONT.

British Associates:
GENERAL ENGINEERING CO., LTD.,
BURY ROAD, RADCLIFFE,
LANCS., ENGLAND

WIRE
AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 24 JUNE, 1949 No. 6

A Mechanical Test To Measure The Workability Of Wire

by

Walston Chubb, Jr.*

and

Dr. D. S. Eppelsheimer**

The Report given here on the transverse - crimp - sensitivity test has been prepared for the Ludlow-Saylor Wire Company at the School of Mines and Metallurgy and the material contained therein is contributed by the company for the information of the industry.

WHENEVER wire is to be fabricated into cables, cloth, or fencing, it is desirable that the raw wire be uniform and free from defects that may effect its workability. Wire that is annealed after drawing is particularly likely to be non-uniform. Such non-uniform wire often causes delays in fabrication and results in inferior and possibly unacceptable products.

★ ★ ★

AT present in wire mill quality control laboratories, it is customary to determine the tensile strength and elongation of samples of wire; and experience shows that certain combinations of these physical properties result in superior workability. However, when non-uniform wire is subjected to these tests, the results can be very erratic and misleading. The physical properties of tensile strength and elongation give only an indirect measure of the workability of wire, and they do not give any indication of variations in workability along the length of the test specimen. The tensile test may sometimes completely overlook non-uniformities in wire, because the test always indicates the strength of the weakest point in the test specimen. The test described here has been found to be capable of detecting very small differences in the workability and stiffness of wires. It will detect differences in "hardness" of hard drawn wire and differences in heat treatment of annealed wire. It will disclose seams and laps, tears, and all other defects that materially effect the workability of wire.

★ ★ ★

The Transverse Crimp Sensitivity Test

THE "transverse crimp sensitivity test" is essentially a refinement of the bend test for ductile materials. It is not a fatigue test. It is the outgrowth of a simple manual test used by workers at **The Ludlow Saylor Wire Company** as an aid to selecting uniform wire for weaving into cloth. The values obtained from the transverse crimp sensitivity test can be readily interpreted in terms of the degree of heat treatment that a wire has received or in terms of the workability of the wire. The test was developed primarily as an acceptance test for annealed steel wire used in the weaving of wire cloth.

★ ★ ★

THE apparatus for the test consists of a steel yoke and a ten-

*Research fellow at the Missouri School of Mines and Metallurgy, working under the auspices of The Ludlow-Saylor Wire Company.

**Professor of Metallurical Engineering at the Missouri School of Mines and Metallurgy, and Director of Research.

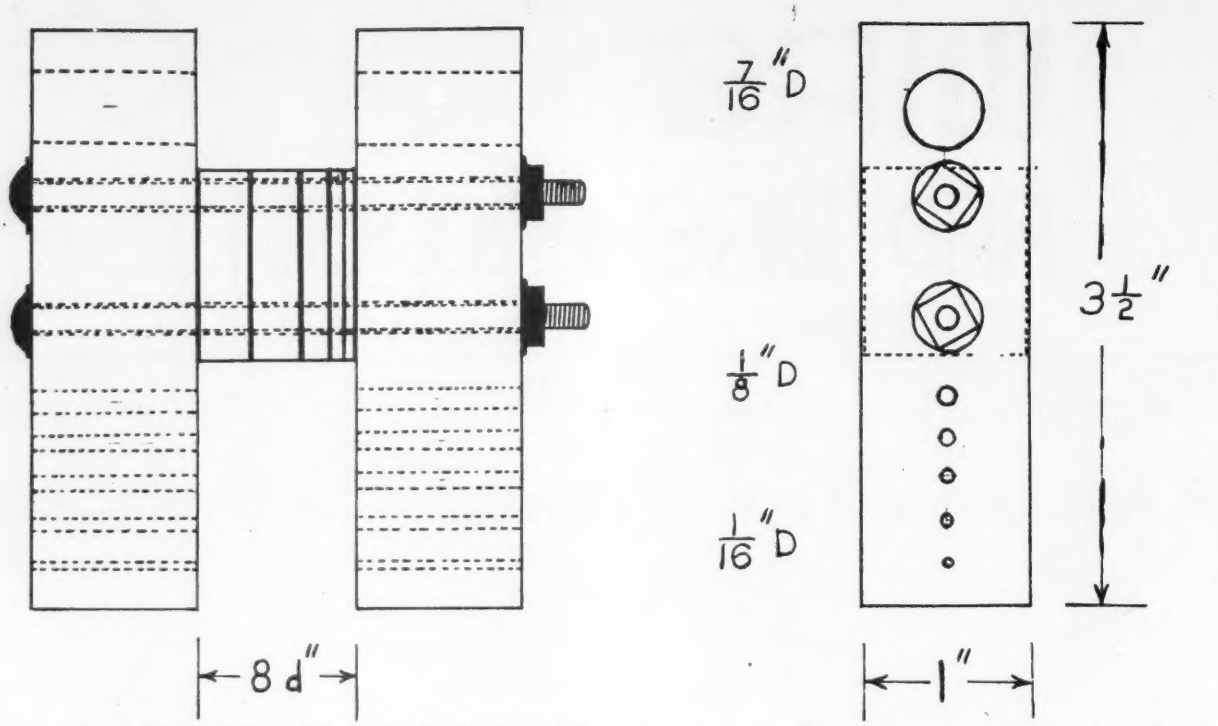


Figure 1 — Drawing of Yoke used in the Transverse Crimp Sensitivity Test.

sile testing machine having a load range of zero to one hundred pounds. The tensile machine should have a loading rate of less than a half inch per minute and should be capable of starting and stopping quickly without appreciable inertia effects.

★ ★ ★

THE yoke consists of two, rectangular, steel pillars held apart by shims. When a test is to be performed on a certain size wire, the shims are adjusted to give the desired span between the two pillars, and then the whole device is bolted together with two bolts. Separate yokes could be used for each size of wire, but the yokes used in developing this test were merely adjusted every time a different size wire was tested. The device is shown in detail in figures 1 and 2. The large hole at the top is 7/16 inch in diameter. A 3/8 inch rod is passed through this hole and through a loop of heavy wire suspended from the upper jaw of the tensile machine. The next two holes are 3/16 inch holes for the two bolts which pass through the pillars and shims and hold the pillars together. For convenience and for theoretical reasons, the shims are adjusted so that the span of wire between the pillars has a length equal to eight times the nominal diameter of the wire. The bottom five holes in the pillars are the holes through which the wire specimens are passed. For speed of manipulation of the wire and to reduce the effect of frictional forces, it was found desirable to test a particular size of wire in a hole about 0.02 inch larger than the wire. Smaller holes tend to increase the frictional forces between the wire and the yoke. These frictional forces may have a controlling effect upon the results if the wire is kinked or oversize. Still larger holes merely increase the effective length of the span, tend to make the span an unknown instead of a known factor, and reduce the sensitivity of the test. These five holes are 1/8, 7/64, 3/32, 5/64, and 1/16 inch in diameter. Twelve gauge (Washburn and Moen) wire is tested in the 1/8 inch hole; thirteen gauge wire is tested in the 7/64 inch hole; fourteen and fifteen gauge wires are tested in the 3/32 inch hole; sixteen and seventeen gauge wires are tested in the 1/16 inch hole. Lighter gauge wires may be examined with this apparatus, but the accuracy and sensitivity of the test are greatly reduced if the one hundred pound tensile machine is used for testing wires with transverse strengths less than twenty pounds. A much more delicate "stiffness testing" machine is recommended for investigating the workability of fine wires. Wires with transverse strengths greater than one

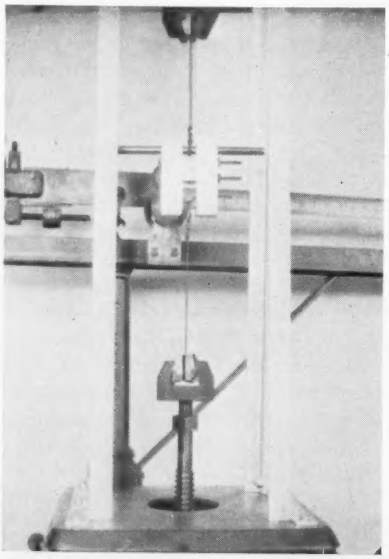


Figure 2 — Tensile Machine and Yoke showing how a Wire Specimen is Crimped in a Transverse Crimp Sensitivity Test.

hundred pounds must, of course, be examined with heavier equipment. Heavier equipment has been used in a few cases to produce loads up to two hundred pounds with equally satisfactory results. However, the equipment described here covers most of the range where heat treatment variations in steel wire have been found to be especially important.

★ ★ ★

THE testing procedure involves adjusting the shims to give a span between the pillars of eight times the wire diameter. The device is then suspended from the upper jaw of the tensile machine, and a zero adjustment or reading is made on the tensile machine. A straight wire specimen, two or three inches long, is then inserted through the proper holes in the pillars. A loop of wire of the same gauge as the specimen is looped over the center of the specimen, and the ends of the loop are secured in the lower jaw of the tensile machine. Load is then slowly applied to the specimen until the center of the specimen has been deflected a distance equal to four times the diameter of the wire. This produces a ninety degree bend in the specimen. The maximum load applied up to this point is the value of crimp sensitivity desired. This value in pounds is a measure of the degree of cold working and/or subsequent heat treatment that wires of the same size and analysis have received. It is a direct measure of the workability of the wire.

★ ★ ★

Theoretical Considerations

USING the equation for elastic deflection of a beam loaded at its mid-point and inserting the constants for this test and a factor (k/1000) to take care of plastic deformation, the following relation is obtained:

$P = (3/256)\,(k/1000)\,(3.1416)\,E\,D^2$

or for steel:

$$P = 1105\ k\ D^2$$

where P is the load at the end point of the test in pounds, E is Young's modulus, and D is the diameter of the wire in inches.

★ ★ ★

FOR this test and for all wires of the same analysis and heat treatment, k is a factor which does not vary appreciably with the size of the wire. For common annealed steel wire from one manufacturer, k was found to have a value of 9.8 plus or minus ten percent. Variations from this value of k greater than ten percent usually make common annealed wire unsuitable for production of first quality wire cloth; variations of as much as eighty percent have been found in rejected coils of supposedly full annealed wire. Figures 3 and 4 show longitudinal sections of samples of 14 gauge wire cut from opposite sides of one turn of the same coil of common annealed steel wire. This condition was discovered by means of the transverse crimp sensitivity test. It follows, therefore, that k is a measure of workability. It is a factor which varies inversely with the workability of wires; "soft" wires have low "k" values; "hard" wires have high "k" values. Such a factor makes possible the comparison of two different pieces of wire with respect to their ease of fabrication. In practice, of course, it is not necessary to calculate k, since for any given size of wire, the values of P obtained from the transverse crimp sensitivity test are directly proportional to k.

★ ★ ★

Variables in the Test

THE conditions under which this test is performed have some effect upon the results and every effort should be made to standardize the testing procedure. It should

(*Please turn to page 545*)

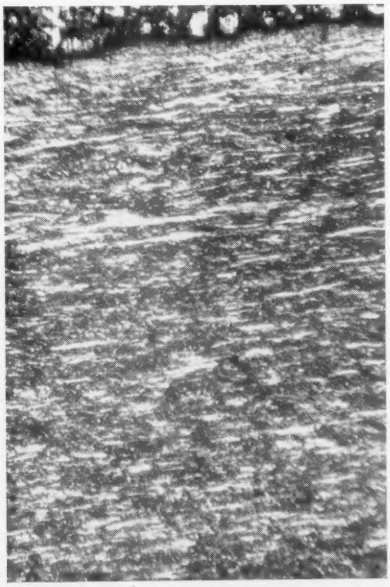


Figure 3 — Longitudinal section of a wire sample taken from one side of a coil of common annealed wire (100x). This sample had a Tukon Hardness of 218. The photograph shows the wire from the surface to the center only.

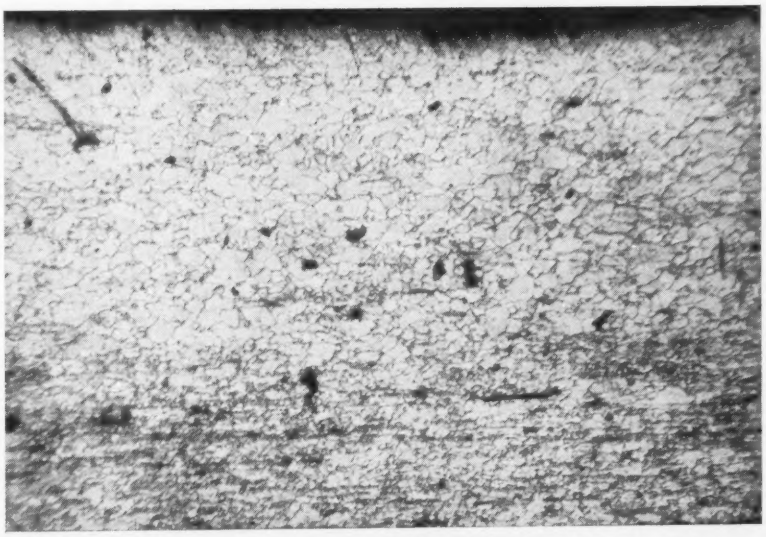


Figure 4 — Longitudinal section of a wire sample taken from the opposite side of the same coil of common annealed wire (100x). This sample had a Tukon hardness of 140. The photograph shows the wire from one surface to the center only. * * * * *

Aluminum Wire

SECTION IV

HEAT TREATMENTS OF ALUMINUM ALLOY WIRE

by D. C. G. Lees, Esq., M.A., A.I.M.
Metallurgist to the Aluminum Development Association
England

This lecture was given at the fourth in the series of four sessions held at the Staff School of Frederick Smith & Co., Ltd., at the Caledonian Works, Halifax, England.

BEFORE describing the particular plant used for the heat-treatment of aluminium alloy wire it will be appropriate to give an account of some metallurgical considerations common to heat-treatment of aluminium alloys in all forms.

★ ★ ★

FOR most of the elements commonly present in commercial aluminium alloys the equilibrium diagram shows a simple eutectiferous system; this is particularly examplified by the case of the copper-aluminium series of alloys, which forms the basis of a number of important alloys, including duralumin. The freezing point of pure aluminium is 660°C and this is reduced by the addition of copper until at 33 per cent the alloy freezes at 548°C. All alloys containing more than about 5.6 per cent copper when alloyed to freeze extremely slowly become completely solid at this latter temperature of 548°C. In the more rapid cooling met with in practice, alloys containing less than 5.6 per cent also become completely solid at this temperature.

★ ★ ★

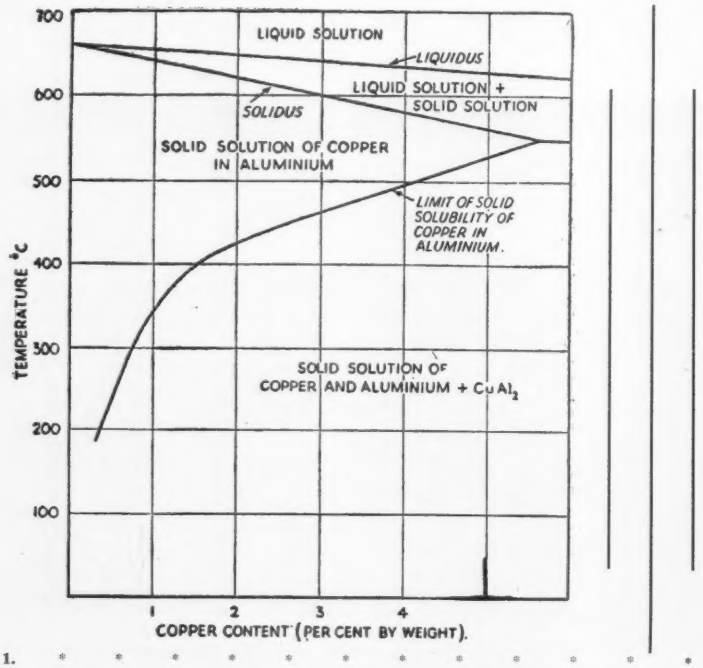


Figure 1.

IF aluminium containing say, 0.1 per cent of copper is examined microscopically, no evidence will be seen of the presence of copper, but as the copper addition is increased particles of an intermetallic compound CuA12 make their appearance. The composition at which this occurs at any given temperature is referred to as the solid solubility of that temperature, but it should be borne in mind that in many cases some or all of the compound initially present will dissolve on prolonged heating. If a series of experiments is made in which alloys containing increasing proportions of copper are maintained at different temperatures, quenched, examined microscopically for the presence of CuA12 particles and the compositions at which the compound just begins to appear are plotted against the temperature, the lower curve in figure 1 will be obtained. This clearly shows the manner in which the solid solubility of copper in aluminium changes with temperature and the maximum value of 5.6 per cent is reached at the eutectic temperature of 548°C. At room temperature the solid solubility is very much smaller,

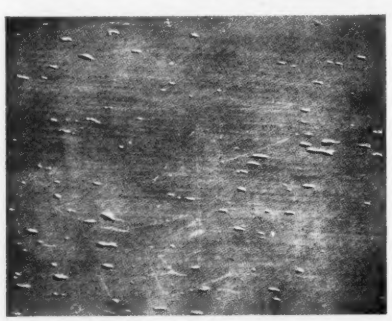
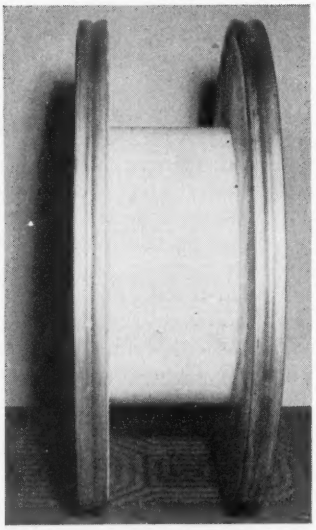
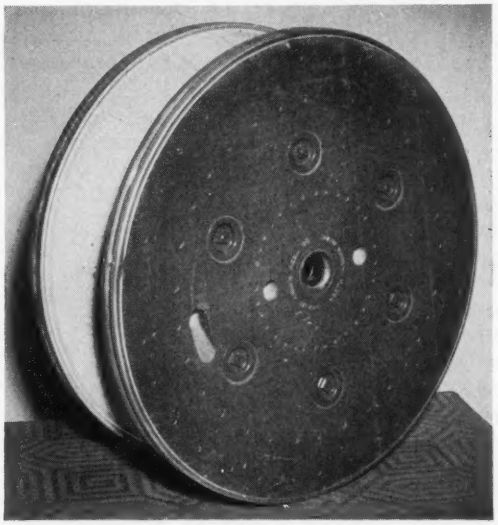


Figure 2.

SAVE $$$





MORE REEL FOR LESS MONEY
NARCO METAL BOUND-12" TO 42"
A SOUND INVESTMENT
THIS METAL BOUND REEL COMBINES GREATER STRENGTH AND LONGER LIFE AT LESS COST.

Address Inquiries To

NORTH ANSON REEL COMPANY

Established 1909

NO. ANSON, MAINE

Telephone: MADISON 187-2

being approximately 0.2 per cent. The line joining the right hand edge of this curve with the freezing point of pure aluminium represents the temperature at which alloys containing less than 5.6 per cent copper begin to melt on reheating. Temperatures along this line must not be exceeded during heat-treatment, since fusion will otherwise take place at the grain boundaries and the material will have to be scrapped. Fig. 2 shows the blistered surface characteristic of overheated material.

★ ★ ★

THE principles just mentioned form the basis of the process known as solution heat-treatment. Thus for instance if a sample of duralumin containing 4.5 per cent copper is heated at 495°C for a period depending mainly on the cross sectional area of the work, all the CuA12 particles will disappear, the compound having been decomposed and the copper taken into solid solution in the aluminium. In practice, solution heat-treatment is very commonly applied not only to duralumin, but also to other alloys both cast and wrought. It is followed by cooling in air or quenching in water or oil. After solution heat-treatment, duralumin and other alloys are in a very soft condition capable of undergoing heavy deformation as in riveting, bending, etc. The solution-treated condition is, however, not generally a lasting one at room temperature and if solution-treated duralumin is allowed to stand at normal temperatures its hardness and strength gradually increase, reaching a maximum after about 5 days. In this hardened state, which has come about quite spontaneously and without further furnace treatment or application of cold work, the alloy has much less plasticity and is unsuitable for many forming operations.

★ ★ ★

THE process whereby the hardened state has come into being, known as "age hardening" or "precipitation hardening" results from the fact that at room temperature the solid solubility of copper in aluminium is only about 0.2 per cent, whereas the alloy itself contains about 4.5 per cent. During storage at room temperature the alloy tends to come into equilibrium by reprecipitation of the copper as CuA12. For simplicity the important complementary effect of the magnesium is ignored. These particles eventually become visible microscopically, although the strength and hardness begin to increase before any precipitation is visible. For certain applications precipitation heat-treatment is desirable because of the enhanced strength and the condition may be brought about more rapidly by heat-treatment at temperatures in the range 120-170°C. This treatment, following the solution heat-treatment is known as "precipitation treatment", or, less correctly, "artificial ageing."

★ ★ ★

IT was mentioned previously that alloys are most easily worked in the solution heat-treatment state. The process of age hardening proceeds more rapidly above room temperature and is, conversely, retarded if the alloy is held at lower temperatures. This low temperature storage may be effected using cold-storage room for large parts, e.g. sheets, while smaller materials may be held in insulated boxes cooled with solid carbon dioxide. The following table shows the times at different temperatures which B.S. 2L37 rivets may be held before forming.

20°C	2 hours.
0 - 5°C	45 hours.
-15 — 20°C	150 hours.

★ ★ ★

THE above mentioned three treatments, i.e. solution treatment, precipitation treatment and refrigeration apply to those alloys which owe their strength to the microscopical distribution of the constituent elements. These include duralumin and its many modifications, and magnesium silicide alloys such as Almelec and Aldrey. There is another important group of alloys whose enhanced strength is due not to heat-treatment, but to cold work. This second group includes aluminium-magnesium alloys containing for instance 2 to 8 per cent magnesium, aluminium-manganese alloys containing approximately 1.5 per cent manganese, and aluminium of normal or super purity, i.e. 99.5 per cent and upwards.

★ ★ ★

THE strength and hardness of these alloys is greatly affected by the amount of work they have received, for instance, by wire drawing, and the processes of solution and precipitation heat-treatment are not applicable to them. Much material in this section is sold in the hard-drawn state, but when necessary for forming or for increase of electrical conductivity in the case of commercial-purity aluminium the material may be softened by annealing. This involves treating the metal at temperatures around 300°C for a time which depends on the section of the work and on the hardness it is desired to leave in the metal. Thus, work-hardened alloys may be supplied in several tempers referred to as hard, three-quarters hard, half-hard, etc. according to the relation between their strength and that of the fully hard and fully annealed material. Annealing is generally followed by slow cooling. Slight age-hardening may sometimes occur after annealing, and this should be borne in mind when any further work has to be applied to softened material.

★ ★ ★

IN softening clad materials, account must be taken of the fact that alloying elements from the core may diffuse, with prolonged times of annealing, into the cladding, the corrosion resistance of which is thereby reduced.

★ ★ ★

IT is desirable in annealing alloys to heat them up to the treatment temperature as rapidly as possible, since slow heating favors excessive grain growth and prolonged storage at temperature is also undesirable for the same reason. The extreme of grain growth is reached when material which has undergone a critical degree of deformation, for instance by stretching, is annealed for extend-

ed periods. It is possible under carefully controlled conditions to produce wires composed of a single crystal by this means. This has been known to occur in normal practice and the possibility should not be overlooked.

★ ★ ★

Furnaces

MOST heat-treatment of wrought aluminium alloys, including wire, is conducted in electrically heated furnaces. These have many advantages, including temperature uniformity and control, both of which are very desirable features in connection with aluminium alloys. Little use is made of controlled atmosphere in heat treating light alloys, although it has been shown that for magnesium containing alloys, small additions of hydrogen in the furnace atmosphere may help to reduce blistering. Heat-treatment for light alloy wire is mainly carried out batch-wise rather than by continuous annealing etc.

★ ★ ★

PROBABLY the most important type of electric resistance furnace is the forced air-circulation type shown in fig. 3. In these furnaces, the heating elements are arranged vertically and, by means of the fan installed at the bottom of the furnace, air is maintained in constant circulation, passing upwards over the elements and down over the work which is normally loaded in heat-resisting steel baskets. Temperature is normally measured by two thermocouples, one immediately below the work basket to record the temperature of the air after passing through the load and the other mounted at the top to record the temperature of the air before it reaches the work. Furnace temperature is controlled by the latter thermocouple. For quenching or slow cooling the work is removed in the basket.

★ ★ ★

A GREAT deal of use is made in the heat-treatment of wrought light alloys of salt-bath furnaces. Normally the salts used are mixtures of nitrates and it is possible to work down to quite low temperatures, such as 220 deg.C. Salt-bath treatment is particularly applicable to rivets which may be immersed in the bath in a container consisting of sections of steel pipe closed at the bottom. A thermocouple may be placed at the centre of the bath of rivets. The containers should be equipped with proper handles so as to make possible rapid removal from the bath and to facilitate quenching by tipping the container.

★ ★ ★

THIS is a suitable point at which to mention a number of general precautions applicable to heat-

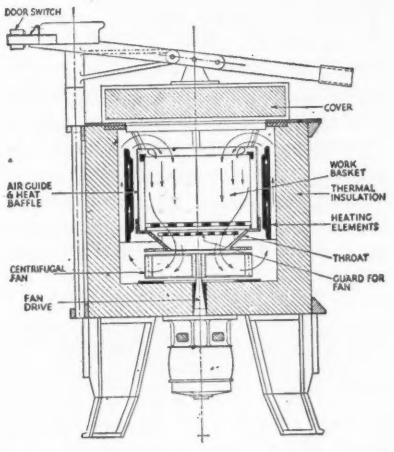


Fig. 3. * * * * * *

treatment. In any case where work is treated by direct immersion into salt baths it is most important that it should be free from grease, water etc. On immersion into the molten salt these foreign substances are liable to generate large volumes of gases, causing spluttering, which is dangerous to the operator. The work should always be totally immersed in the bath. After solution treatment, quenching should follow with the least possible delay. It has been shown that delay in quenching may result in inferior mechanical properties and resistance to corrosion. There is some danger in the salt-bath treatment of alloys containing appreciable magnesium and these should generally be treated in forced air-circulation furnaces.

★ ★ ★

Discussion on Heat Treatment

Mr. Bedford

I WOULD like to ask if annealed aluminium should be cleaned before drawing in the same way as must heat-treated steel, also whether a stain caused by annealing could be easily removed.

★ ★ ★

Mr. Lees

HEAT-TREATED steel is cleaned in order to remove the scale. Such a scale would not be formed on aluminium. With regard to the removal of a stain, this might cause some difficulty and obviously prevention is better than cure.

★ ★ ★

Dr. Goodacre

IF you have an oxidizing atmosphere it is almost essential to clean after annealing, otherwise the metal will be covered with aluminium oxide. I would recommend cleaning with caustic soda followed by nitric acid. Failure to clean would probably result in heavy die wear.

★ ★ ★

Mr. Lees

WHERE an alloy containing more than 2 per cent of magnesium is annealed, moisture in the furnace atmosphere can cause blistering of the metal. This can be avoided by the addition of hydrogen fluoride which forms a thin film of magnesium fluoride on the surface of the alloy. In this case also it will be necessary to clean the material in order to avoid excessive die wear.

★ ★ ★

Mr. Peter Smith

SHOULD a 2 per cent magnesium alloy be cleaned after annealing, and if so, would hydrochloric acid be a suitable agent?

★ ★ ★

Mr. Lees

IT would be advisable but not essential, as the die pressures with

(*Please turn to page 543*)

Static vs Dynamic Test Methods

By John N. Kenyon
Consulting Research Engineer
Princeton, N. J.

The second of a series of papers being published in WIRE AND WIRE PRODUCTS on the Fatigue Problems in Metals with Special Reference to Wire.

TESTING machines for determining the physical properties of engineering materials have been constructed for over 200 years. The more common **static** types are the tension (or compression), torsion and cold bend machines. While the straight-across (fatigue) break in metals has been recognized for a century, there has been a considerable lag in the development of **dynamic** test methods. In 1930, only two types of fatigue machines were in successful operation, but important developments came during the next five years.

★ ★ ★

THE progress in testing machine development will be briefly reviewed under the following headings:

Static Testing Machines

A **STATIC** test may be defined as one wherein a steadily increasing load is applied up to the point of ultimate failure. An early American tension machine (about 1879) was a Fairbanks-Morse platform scale whereon were erected two vertical columns with a cross-head. The specimen was suspended from this cross-head and a tension force applied by a lever arrangement. This tension load in pounds was read directly off the balanced beam-scale.

★ ★ ★

THE "weighing capsule" was designed in 1886 by Mr. A. H. Emery of Yale and Towne. It consisted of an oil-filled metallic disc connected directly to a highly sensitive pressure gage. The capsule distorted elastically under loading, extruded oil and actuated the gage. The gage was graduated by subjecting the capsule to known loads.

★ ★ ★

THE first torsion machine was probably a lathe, wherein one end of the specimen was gripped in the chuck and slowly rotated. The other end of specimen was supported by a steady rest and fitted with a rigidly attached lever-arm and sliding weight. As the lathe-head turned slowly, the weight was moved outward thus holding the lever in horizontal position. Loads were recorded in foot-pounds. Today, there are a large assortment of static testing machines but they are, in general, refinements of the basic principles just described.

★ ★ ★

Dynamic Test Methods

A **DYNAMIC** test (fatigue) is one that does not bring about immediate failure in the material, but exerts a pulsational force within a given range of stress and, usually, considerably below the elastic limit. The ultimate break is usually straight-across (without plastic flow) and resembles the fracture in a glass rod.

★ ★ ★

THE two fatigue machines, in successful operation in 1930, were the rotating-beam type (1/3d point loading) and the rotating cantilever (end loading). Both machines required a machined, **polished** and reduced test specimen; with failure confined to the center. In 1930, it was becoming increasingly evident that the two conventional types of machines were unsuited for testing wire materials. The obvious need was for a method of testing the wire in long lengths and in the processed condition, so

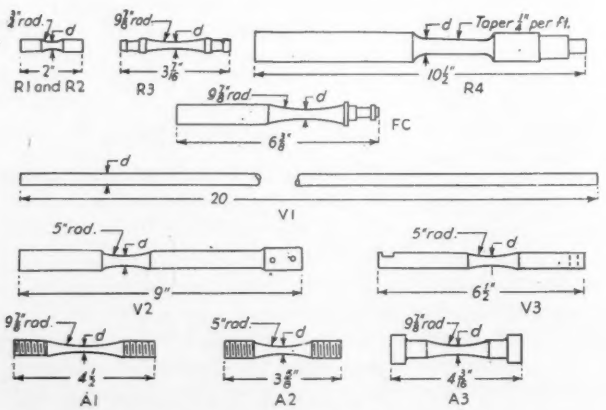
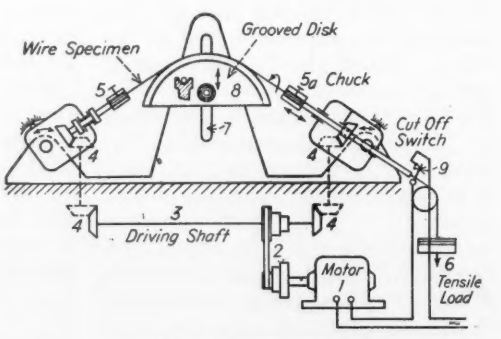


Figure 1



Wire Fatigue Testing Machine.

Figure 2

NEWEST THING IN STAINLESS STEEL *Since its Invention!*

We put that in great big letters, so you wouldn't miss it —it's too good to miss!

STAINLESS STEEL, the beautiful, versatile "problem child" of the wire industry, need no longer be lead-coated in order to obtain the desired reductions. Metalcoat #267, with intermediate annealing, will draw No. 5 rod down to the finest sizes. Yes, 85% reduction — or more, if necessary.

Frankly, there's a trick to it, as there are tricks to all trades. Metalcoat #267 won't do a thing for Stainless Steel unless you know that little trick. In "Sixty Secret Seconds" we can take the temperament out of Stainless Steel and make it pick up—and *hold*—the coating compound and lubricant.

Lead is scarce, expensive, and very hard to remove after the wire is drawn. Why pamper Stainless Steel with lead when you can draw it with no more effort or expense than when drawing carbon wire? So much faster, too, with Metalcoat #267.

Don't wait until tomorrow—write us *today* about what goes on during those "Sixty Secret Seconds."

Don't Wait Until Tomorrow!

Write us today about what goes on during those "SIXTY SECRET SECONDS"

MAGNUS CHEMICAL CO., INC.

Metal Coating Division

Garwood New Jersey

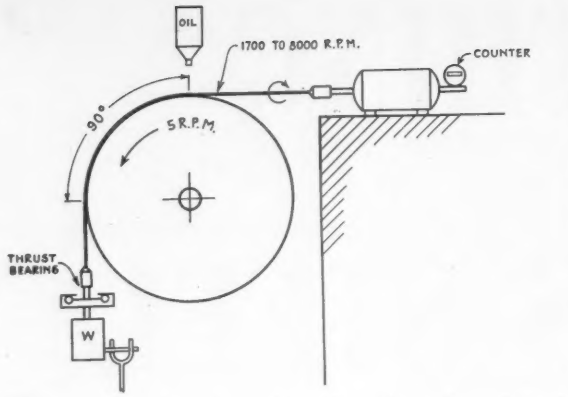
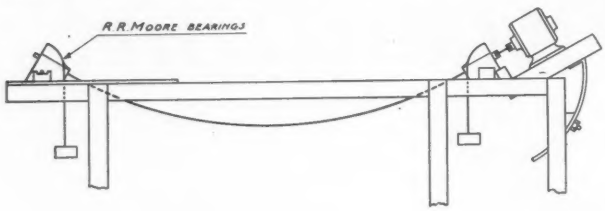


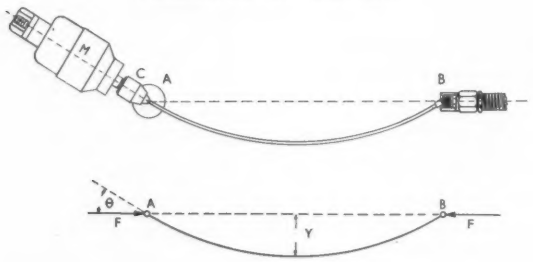
Figure 3.



SHELTON WIRE FATIGUE MACHINE

Figure 4.

PRINCIPLE OF ACTION



One end of the wire A is gripped in a chuck C as in the headstock of a lathe, and the other end B is arranged to run on a specially simple form of ball thrust-bearing that serves as a tailstock.

This tailstock bearing is screwed forward to flex the wire as sketched, and the chuck C—together with the small electric motor M that drives it—is arranged to swivel about a vertical axis on bearings A.

Figure 5.

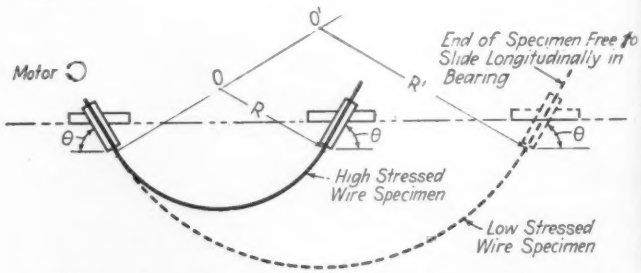


Figure 6.

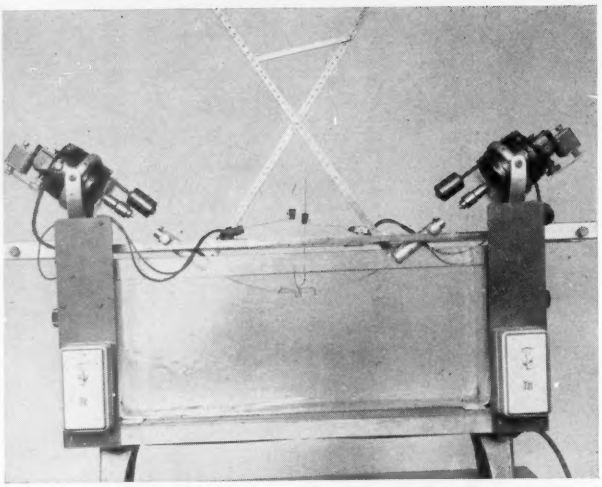


Figure 7.

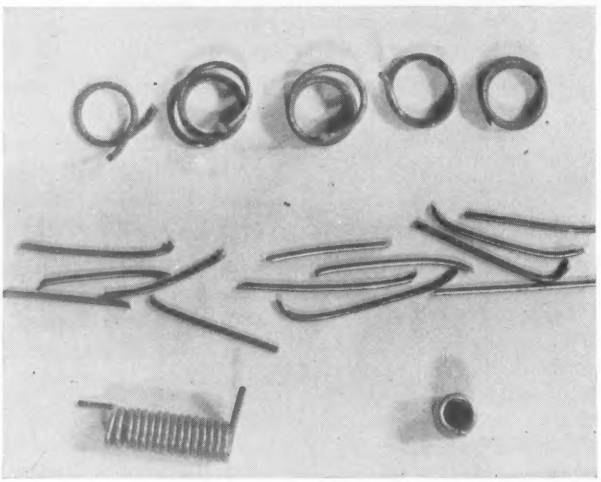


Figure 8.

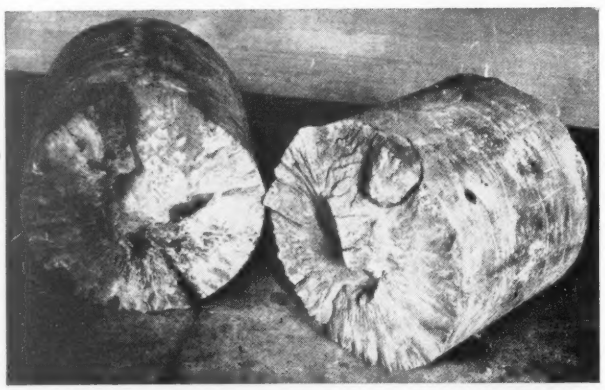


Figure 9.

as to **integrate** the combined effects of surface imperfection crystalline inhomogeneity and simultaneous corrosive attack.

★ ★ ★

The Development of Wire Fatigue Testing Machines

THE ultimate goal in the design of wire fatigue testing methods, was a technique whereby the specimen could be subjected to the desired fatigue effect over a considerable length. This would be at-

(*Please turn to page* 525)

OCTOBER—the month of the ANNUAL CONVENTION of the WIRE ASSOCIATION

It is early, but not too early to begin planning for your special October Convention ADVERTISING.

Your Program Committee has arranged what is without question the most impressive program so far assembled for this important annual event. (See index to locate program of papers and functions.)

Your advertising, that of regular advertisers and of others whose interests bear upon the Wire Industry, should be in keeping with the occasion. Start your planning for it NOW.

There hasn't been a year for a long time when your advertising is so important — to YOU and to building up generally better conditions.

Let us know as soon as possible what space you will want. If you do not have them, advertising rates will be furnished on request.

WIRE AND WIRE PRODUCTS

300 MAIN STREET

STAMFORD ● CONNECTICUT

Materials Handling in the Wire Industry

THE wire industry, along with the other members of the metals industries, was one of the first users of mechanized handling equipment. The primary reason for its early acceptance of modern handling techniques, is the fact that the great weight of metal products quickly points to savings in time, manpower, and money made possible by mechanized handling.

★ ★ ★

AS handling procedures develop, many special techniques are applied to the handling of metal products. The following article gives specific ideas* used by five different wire manufacturers. From it the reader can gain a thought or two as to how he can improve specific handling operations in his plant; but for overall savings, it is recommended that a survey be made of existing methods, that the survey be analyzed, and that improvements be made on a plant-wide rather than a piecemeal basis.

* From the files of The Yale & Towne Manufacturing Company, Philadelphia Division, Roosevelt Blvd. and Haldeman Ave., Philadelphia, Pa.

FIGURE 1 illustrates the use of a tractor truck to transport bars of silver nickel from the overhauling machine to drawing equipment. Bars are delivered directly onto the trailer. This eliminates an extra handling step as bars do not have to be lifted onto the trailer. The bars are stacked on structural members running across the trailer. The angle-iron side-members of the trailer are cut at two intervals to permit the forks of a fork truck to slip in under the rods and lift them either for stacking in storage or feeding into drawing machines. This ingenuity permits the fork truck to load itself.

★ ★ ★

FIGURE 2 illustrates the use of a ram truck to tier coils of wire. This truck handles as many as a dozen coils at once. Overhead space, which could not be used economically otherwise, is made available for storage. Also, the storage zone is neater and inventory taking is made easier. The ram is replaceable by forks for handling boxes, drums, etc.

★ ★ ★

FIGURE 3 illustrates another time-saving fork truck attachment employed in the metal industries to expedite handling operations. The device comprises adjustable steel clamps for handling pigs—say lead for wire-coating. The truck carries pigs from storage to melting pots where they are added to the pot for melting and application to single strands of wire or to wire cables. The clamping device is replaceable by forks for such duties as unloading and loading incoming and outgoing shipments.

★ ★ ★

FIGURE 4 illustrates the use of the electric hoist in handling coils of wire. The hoist is mounted on an overhead rail and in effect is a monorail conveyor. The hoist makes it possible to lift coils weighing up to 250 pounds without physical exertion. The operator merely engages the hook into the coil binding, and lifts and lowers the load by pushing electric control buttons. An ingenuity in this case is the stiff arm welded to the hoist. The arm is fabricated from steel flats and permits the operator easily to push the hoist back and forth along the overhead track.

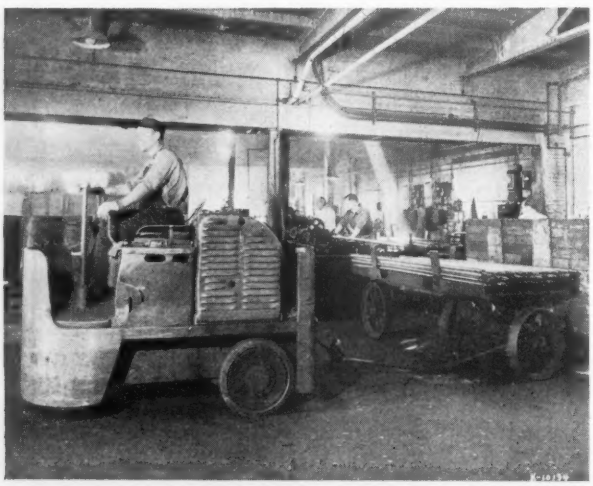


Fig. 1. Tractor Truck Transporting bars of silver nickel from overhauling machine to drawing equipment. * * * * * *

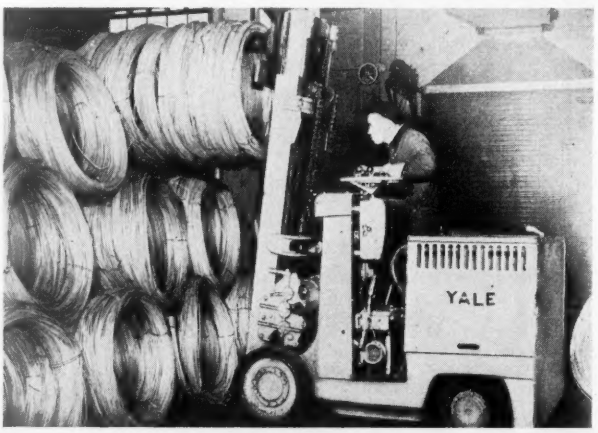


Fig. 2. Ram Truck used to tier coils of wire. * * * *

FIGURE 5 illustrates an electric hoist in conjunction with a special attachment to unload coilers. The legs of the attachment are collapsable and fit into slots in the coiler. To disengage wire from the coiler, the legs are expanded and the attachment is withdrawn by the hoist.

★ ★ ★

ONE company improvises a ram truck for transporting coils by making use of a ten-foot section of railroad T-rail and a high-lift platform truck. The rail fits into a clamp welded to the back-plate of the truck platform and extends over the length of the platform. The portion extending over the platform is the ram. The ram is covered with a piece of automobile tire casing to protect coils from abrasion.

★ ★ ★

THIS same company uses another device for handling reels of wire. In this case, two small I-beams are formed into a V and the sections protruding over the length of the platform of the truck are bent parallel to one another. At the ends of each parallel section, a seat for a round rod is welded. To lift a reel, an axle is inserted through the centerhole of the reel, the round holes of the I-beams are positioned under the axle, and the platform of the truck raised. By using this setup, the platform truck easily loads street trucks which are backed up to a receiving platform.

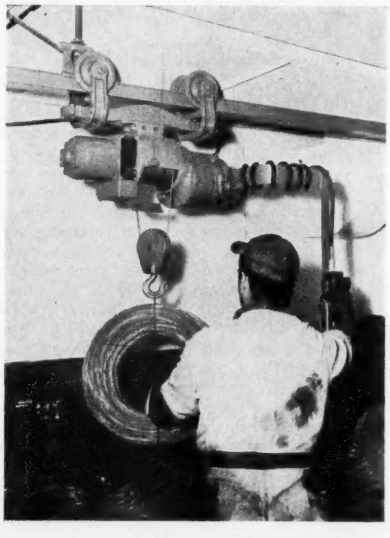


Fig. 4. Electric Hoist used in handling coils of wire.

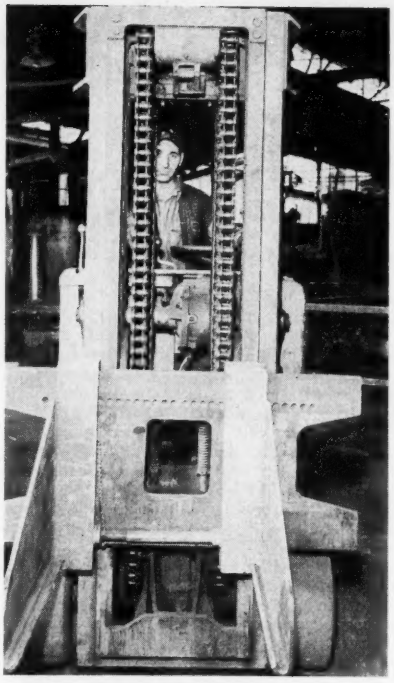


Fig. 3. Fork Truck Attachment.

★ ★ ★

THE foregoing are specific techniques used by wire manufacturers or processes to handle their material. The following basic principles of efficiency in materials handling, adapted from the National Paper Trade Association, are general principles which should be kept in mind before analyzing material handling in your plant.

1. Economy in moving materials is obtained by *not* handling them. Eliminate all handling operations except those which are absolutely necessary.
2. Combine operations whenever practicable to avoid handling or transportation from one operation to the next.
3. Use gravity for relatively inexpensive transportation whenever possible.
4. Use mechanical assistance to the widest extent practicable.
5. Provide continuous or appropriately intermittent flow of work in order to prevent stock from piling up and in order to keep handling equipment at a constant level of operation.
6. Lay out definite routes of travel to avoid congestion an unnecessary shuffling of equipment and materials.
7. Avoid low-cost handling at one stage which causes high-cost handling or unnecessary rehandling, at another. Low overall handling cost is the goal.
8. Install standard equipment which has demonstrated its effectiveness. Use special equipment only under special circumstances.
9. Buy equipment for overall savings, not first cost, and be sure that the equipment actually can be used in all the operations for which you are buying it. The investment must be justified by the savings after deducting all fixed charges and expenses related to it.
10. Provide for alternate methods in case of breakdown.
11. In loading, unloading, or transporting operations, handle material in as large a unit load as practicable.
12. Avoid transfer from floor to conveyance or vice versa, and from conveyance to conveyance when this involves handling in small units.
13. When storing materials, stack as high as practicable to obtain most efficient use of floor space. (Do not interfere with full flow of water from sprinkler heads, however.
14. Provide suitable running surfaces and clearances for self-propelled materials handling equipment.
15. Avoid "empty-handed" movement of warehousemen, conveyances, and elevators. Provide for return trip loads as much as possible by proper scheduling of materials flow into and out of stock.
16. Remove all operating hazards in methods and equipment to prevent accidents.
17. Provide instruction so as to train workers, old and new, in the most effective use of equipment and its maintenance.

★ ★ ★

IF you believe that your operations conform entirely or largely with these principles, we suggest you spend an hour or so in your plant looking for violations of them. We can almost guarantee that you will find some.

★ ★ ★

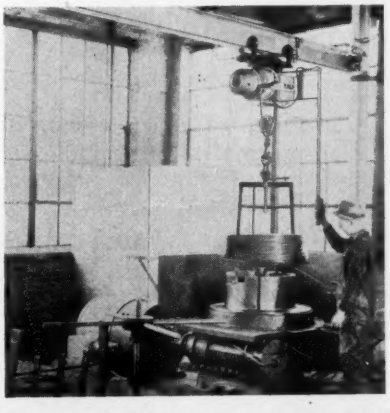


Fig. 5. Electric Hoist with special attachment to unload coilers.

Diamond-Powders and Wire Die Finish

By

E. J. Schneider, Vice-President
Engis Equipment Company
Chicago, Ill.

THE recent tightening in the supply of industrial diamonds, particularly in the raw material for diamond powder production, has focused interest on means of applying and using them with the greatest possible economy and effectiveness. Great progress in this respect was made during the war when standards for diamond powders were developed by the U. S. National Bureau of Standards in cooperation with industry. While these standards, which are now embodied in commercial standard No. CS 123-45, may be subject to some slight revision in the near future, they have permanently established the following principles:

(a) Graded diamond powders are classified in specific ranges of particle sizes.

(b) Standards have been set for the largest permissable amount by weight and by number of particles smaller than the lower limit of the size range (fines).

It has been specified that no particles larger than the largest size within the size range should be present.

(c) A limit has been set on the maximum permissable percentage of impurities present in diamond powders.

★ ★ ★

IN this manner it is now possible to inspect each batch of powder in relation to a National Standard and to determine its suitability for any specific application.

★ ★ ★

IN addition to proper grading of diamond powders, the following points might suitably be mentioned:

(a) There appears to be no scientifically proven evidence that diamond powders vary in their performance, depending on the type of raw material from which they are crushed (location of mine). It has, in the past, been assumed that diamond powders crushed from high-grade industrial stones such as broken diamond dies would show superior abrasive effectiveness. While there is apparently still some opinion in the trade that such diamond powders are superior on certain operations involving the polishing of diamonds themselves, this opinion does not seem to be supported by tests made so far.

(b) The processing of diamond powders appears to be important as to the shape of particle produced, especially its sharp edges and points which actually do the abrading. Powders that have been re-crushed repeatedly or powders that have been reclaimed are likely to have dulled edges and will therefore remove less material and perform slower. While it has been felt in the past that such powders could well be used on polishing operations, it would appear to be proper to use correctly crushed finer powders for this work, which will permit a saving of time and material.

(c) In the crushing and grading process pieces of unusable shape such as "flakes", "slivers", etc. should be held to a minimum or completely eliminated.

★ ★ ★

ASSUMING that diamond powder is available which is properly crushed and graded to insure maximum efficiency in operation, the problem arises as to how these powders can be applied to the work and tool without either waste of material or waste of operator's time.

★ ★ ★

THE conventional method has generally consisted in permitting the operator to mix diamond powders in olive oil or a similar vehicle and to leave it to his discretion as to how the mix is made and how it is applied to the job.

★ ★ ★

AS all liquid vehicles are considerably lighter in specific gravity than diamond powders, they are not able to hold them in permanent suspension. This was of some advantage when the operator did a grading job in the mixing by taking the mix from the bottom of the jar for rougher operations and from the top of the jar for polishing operations. Naturally, such grading was extremely crude and present industrial grading methods to National Standards make it entirely unnecessary.

★ ★ ★

IT is desirable, therefore, to give to the operator diamond powder permanently mixed and uniformly suspended in a vehicle and with such tools for application of the compound which will insure that it can be permanently stored, protected from dust and other impurities and be applied to the job in controlled amounts. For this purpose the following characteristics will be required:

(a) Regarding the Diamond Powder contained.

(1) The quality of the powder must be clean and free from impurities, properly crushed and graded to standards.

(2) The concentration of the diamond powder must be the optimum for the job to give fastest performance without waste. Concentration beyond this optimum will not increase cutting action and may sometimes even prove harmful. Diamond powders must be uniformly and permanently dispersed so that performance will be repeated reliably.

★ ★ ★

(b) As to the Compound.

(1) General Characteristics.

(a) The compound must be storable at normal temperatures for a sufficiently long period—preferably one year or more—without change in its operating characteristics.

(b) The compound should preferably be colored throughout* so that the operator can quickly and reliably check the proper grade that is to be used each time. This color should suitably disappear as the compound cuts, but not without proper cutting pressure or removal of material. In this way the color, or rather its disappearance, will serve as an indicator to the operator that he is using it properly.

(c) The compound should be furnished in such container and applicator as will permit accurate metering of amounts used, as well as amounts remaining. For this purpose it is best to have the container of glass or other transparent material to permit rapid visible check. Applicator should be sufficiently rigid to prevent breakage and sufficiently large to eliminate loss or easy theft. The best combination so far appears to be a glass cartridge fitting interchangeably into a metal applicator. The cartridge is sealed air tight before it is put into the applicator and the applicator, in turn, can be closed tightly. The design should be such that it will encourage ease of use and greatest economy at the same time.

*With different colors for each grade.

(2) Characteristics—regarding performance.

(a) The compound should spread readily on to work and tool.

(b) The compound should be retained on work or tool even if rotating at normal operating speed.

(c) The compound vehicle (base) should be so designed as to release the diamond particles with their greatest cutting ability as soon as cutting starts. It is found for this purpose that a certain viscosity at the time of cutting is essential.

(d) The compound should be so designed that by the addition of fluids or lubricants it will retain maximum cutting ability as long as possible even though abraded particles become mixed with it.

(e) Fluids or lubricants should be available to permit the operator to adjust the cutting action of the compound to different types of operations, depending on whether fast stock removal or better finish is required, whether the operation is performed in a horizontal or vertical position of the die or whether the operation is done manually or by automatic or semi-automatic machine.

(f) It is also furthermore to be desired that the compound can quickly be dissolved in commercially obtainable media either for cleaning of the die or for eventual recovery of diamond particles from waste.

★ ★ ★

THE value of a very high polish on Tungsten Carbide dies is sometimes questioned by advancing the argument that the polish will quickly disappear as soon as drawing starts. It is, however, to be considered that a high polish not only serves to reduce friction in the die but also permits easy and reliable inspection. The final mirror polish of Tungsten Carbide dies with proper diamond compounds require so little time that it is desirable in all instances to polish them fully so that under proper magnification every flaw can be detected quickly.

★ ★ ★

IN Switzerland a special microscope has been developed which is equipped with two sets of objectives and two illuminators. Magnification from 20 to 100 times is available and the die can be rotated so that not only surface conditions but also proper tapers can be inspected.

★ ★ ★

IMPROVED methods of inspection to follow the existing improved methods of die finishing would appear to be highly desirable as they permit to standardize on dies of uniform high performance.

★ ★ ★

THE existing Commercial Standard CS123-45 contains the following grade designations:

Grade Designation*	Grain Size (Microns) Minimum	Grain Size (Microns) Maximum	Sieve Number (Through)**
1	0	2	—
2	1	3	—
3	1	5	—
3X	0	6	—
6	4	8	—
8X	4	12	—
8	6	10	—
14	8	20	—
25	13	37	—
40	20	60	325
60	35	85	230
90	60	120	170
120	80	160	120
150	100	200	100
180	120	240	80
250	150	350	60
400	250	550	40

"*Grades 1, 6 and 8 are narrow-range grades for exacting work in cutting and polishing fine diamond dies, sapphire bearings, etc. Grades 3X and 8X are wide-range grades desired for some purposes.

**United States Standard Sieve series. Sieve numbers are included for reference only; it does not necessarily follow that powders passing the sieve indicated for a grade will meet the grain-size requirements of that grade, nor that powders retained on the sieve necessarily fail to meet the grain-size requirements."

★ ★ ★

THIS standard is now recommended for revision; which revision proposes the following two tables:

TABLE 1. MICRON SIZES

Particle Size (Microns)	Average Particle Size (designation)
#m 2 and finer	1 micron
#m 1 to 5	3 micron
#m 4 to 8	6 micron
#m 6 to 10	8 micron
#m 8 to 20	14 micron
#m20 to 40	30 micron
#m30 to 60	45 micron

TABLE 2. SIEVE SIZES

Sieve No.	Average Particle Size (designation)
#s 230 to 325	74 micron
#s 170 to 230	106 micron
#s 120 to 170	150 micron
#s 100 to 120	193 micron
#s 80 to 100	230 micron
#s 60 to 80	302 micron
#s 40 to 60	473 micron

★ ★ ★

TO WIRE MILL MEN

Have you considered joining the Wire Association? You are cordially invited to become a member. Dues are $15.00 a year, which includes a subscription to WIRE & WIRE PRODUCTS and a copy of the Annual Buyers Guide.

300 MAIN STREET THE WIRE ASSOCIATION STAMFORD, CONN.

The Manufacture of Coil Springs Under Completely Mechanized Conditions

A description of a most modern and compact installation for the manufacture of coil springs at the Ford Motor Company's Hamilton, Ohio, Plant.

THE parts and equipment manufacturing division of the Ford Motor Company is manufacturing coil springs under completely mechanized conditions at the Hamilton, Ohio, plant, C. R. McCormick, the plant's general manager, said recently.

★ ★ ★

EACH week the Hamilton plant maintains its production schedule without interruption, supplying 50,000 coil springs for both service and production. Approximately 650 coil springs are produced every working hour.

★ ★ ★

DESCRIBED as the most modern and compact installation of its kind in the country, the operation begins on the first floor of the plant where bar steel stock is received from freight cars.

★ ★ ★

PRECISION rolled stock is loaded onto the primary conveyor without alteration while rough bar stock is put through a grinding process which reduces it to specifications. An automatic handling device moves stock from receiving, through the grinding process to an elevator type conveyor which carries all stock to the upper floor.

★ ★ ★

HERE a similar automatic handling device moves bar stock through a gas fired furnace which heats the ends of bars to 1800 degrees fahrenheit. This heat prepares the bar for the swaging operation that follows. The bars move from the furnace conveyor to the swaging machine where bar ends are tapered in a squeeze type rolling machine and run through a parts numbering device. Bars are then moved to a conveyor which carries them into the bar heating furnace.

★ ★ ★

THE bar heating furnace brings the entire unit to a temperature of 1700 degrees fahrenheit in preparation for coiling, another automatic process. Red hot bars are ejected from the end of the heating furnace and moved to the Gogan automatic coiler to be coiled tapered end first. This device literally wraps the red hot bar into its final coil shape. The Hamilton plant uses three of these devices in its coil spring operation.

★ ★ ★

WHEN coiled, the springs are ready for the oil quenching machine which imparts the hardness that specifications demand. From the oil quenching machine the springs are automatically moved to draw furnaces where a normalizing process gives all units uniform hardness.

★ ★ ★

EMERGING from the draw furnaces at a temperature of 820 degrees fahrenheit, the springs are conveyed under a shower bath which brings them to a safe-handling temperature and prepares

(*Please turn to page* 527)

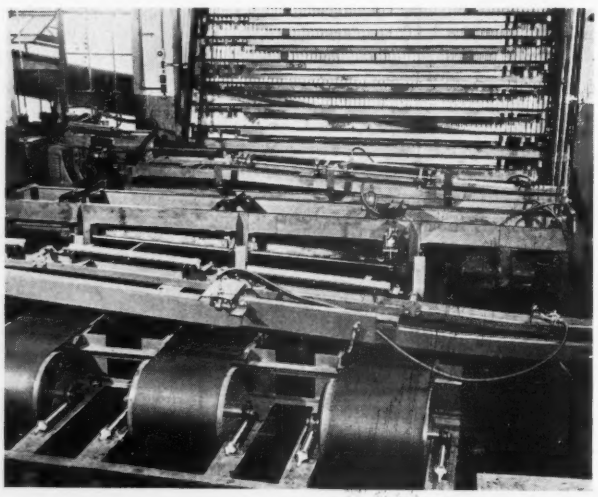


Fig. 1.—Rolled steel stock is moved from the receiving department to gas fired furnaces on an elevator type furnace. This is the primary step in the manufacture of coiled springs.

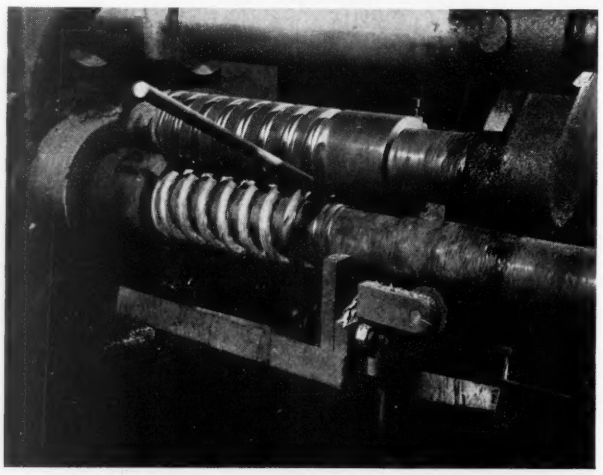


Fig. 2.—A Gogan automatic coiler turns rolled stock into a coil spring. At this stage the spring has been treated in a heating furnace and shortly will be moved to the oil quenching machine.

Wire Association Activities

THE meeting of the Board of Directors of the Wire Association was held April 15, 1949 at the Hotel Biltmore, New York, N. Y., with L. D. Seymour, the President, presiding.

★ ★ ★

IT was announced that the following directors had been elected for the three-year term starting April 1949, and they were accordingly seated:

Richard E. Brown, Publisher, WIRE AND WIRE PRODUCTS, 300 Main St., Stamford, Conn.

H. B. Carnahan, Works Manager, Canada Wire & Cable Co., Ltd., Leaside, Ont., Canada.

Fred M. Crapo, President, Indiana Steel & Wire Co., Muncie, Ind.

L. C. Crewe, Jr., President, Maryland Fine & Specialty Wire Co., Cockeysville, Md.

★ ★ ★

THE Program Committee for the 1949 Convention reported that the program was complete, and submitted full lists of papers, chairman of meetings, and so forth. This program is published in another section of this issue of WIRE AND WIRE PRODUCTS.

★ ★ ★

THE Canadian Regional Meeting Committee, through **Allan Dove** chairman, reported on the arrangements made for this meeting, all of which were approved by the Directors.

★ ★ ★

BY unanimous vote of the Directors present, the following officers were elected for the year 1949:

Details of the Directors' Meeting Held at New York, April 15, and of the Worcester Regional Meeting held at Worcester, Mass., April 22.

President—L. D. Seymour, Mfg. Mgr., Wire Mills Division, John A. Roebling's Sons Co., Roebling, N. J.

Vice-President—Fred M. Crapo, Pres., Indiana Steel & Wire Co., Muncie, Ind.

Vice-President—Ralph B. Roth, Vice-Pres., Ludlow-Saylor Wire Co., St. Louis, Mo.

Secretary and Treasurer—Richard E. Brown, Publisher, WIRE AND WIRE PRODUCTS, Stamford, Conn.

★ ★ ★

A VOTE of thanks was extended to **Mr. Hugh B. Carnahan,** the retiring Vice-President, for his work on the non-ferrous end during the past two years.

★ ★ ★

BECAUSE of the difficulty in securing proper hotel arrangements unless made far in advance, the question of where to hold the Convention in 1950 was discussed, and it was decided to see if the necessary hotel arrangements could be made in Baltimore, Maryland. If these were not available, it was then decided to try Detroit, and the Secretary of the Association is to report on this at the next Directors Meeting in October.

★ ★ ★

The Wire Association Medal Award

BY unanimous vote of the Directors and Program Committee Chairman, the Medal Award for the most meritorious paper submitted during the year 1948 was made to **Reginald S. Brown,** Rylands Brothers Ltd., Warrington, England for his paper entitled, "Wear Resistance of Wire for Wire Rope." Honorable mentions were made as follows: Ferrous Division —**Carl A. Zapffe,** metallurgist and **M. E. Haslem,** research chemist, Baltimore, Md., for their paper on "Evaluation of Pickling Inhibitors from the Standpoint of Hydrogen Embrittlement"; in the Non-Ferrous Division—**Christian Witteveld,** Bridgeport Brass Company, for his paper entitled, "The Processing of Brass Wire."

★ ★ ★

IT was decided to hold the annual Smoker this year on Wednesday night of the Convention week, as usual, and **Mr. Eber Hubbard, Jr.,** Hubbard Spool Company, Chicago, Illinois, was appointed chairman in charge of the activity. Following the Directors Meeting, there was a luncheon at the Biltmore Hotel, with 40 present, at which a very fine address was delivered by **Dr. Allen A. Stockdale** of the National Association of Manufacturers' speaker's bureau. The subject was "How to Guard Business against the Inroads of Communism," and was most favorably received by the audience.

★ ★ ★

The Worcester Regional Meeting

THE Annual Worcester Regional Meeting of The Wire Association was held at the Sheraton Hotel on Friday evening April 22, with an attendance of one hundred and ten.

AFTER dinner, **Rodman R. Tatnall** of the Wickwire Spencer Steel Division of The Colorado Fuel and Iron Corp. opened the meeting, introducing **Leroy D. Seymour,** President of The Wire Association, who welcomed the group to Worcester and traced the development of The Wire Association from its humble beginnings in 1930 to its position of outstanding importance in 1949. He pointed out that one

of its major achievements had been to bring wire men together so that they could become presonally acquainted with one another. By this single accomplishment much had been done to improve relationships between mills and to develop a free interchange of experience-information to the mutual benefit of the members.

★ ★ ★

FOLLOWING the President's address, **John S. Bachman** of the Wickwire Spencer Palmer plant gave an interesting talk in which he traced the history of wire making from its first known start in 1775 in New England through the ramifications of many mergers that have resulted in the present-day Colorado Fuel and Iron Corporation nation-wide organization.

★ ★ ★

AMONG the interesting pictures illustrating his paper were those of early wire drawing dies: stone, cast iron, steel and finally of course, the modern carbide dies. He pointed out that an early cast iron or steel die could draw only 200 lbs. of wire per hole and, even then, the finished wire was substantially off size; whereas, a modern die, besides increasing speeds, is able to draw 800,000 lbs. of wire with little change in the wire size at the end of this service. A day's production by the early hand-drawing processes was about 50 lbs. of wire; the modern production methods will run into many thousands of pounds per day per die. In his talk he brought out the fact that the life of The Colorado Fuel and Iron Corp. spans the entire period of steel in the United States.

★ ★ ★

MR. BACHMAN'S paper was followed by a sound-color film entitled "Indian Paint" shown through the courtesy of The Colorado Fuel and Iron Corporation. This picture, which traced the making of steel in Colorado from the mining of ore to the making of wire rope at Palmer, was an excellent portrayal of steel making processes and equipment. The name "Indian Paint" is derived from the red color of hematite, used by the Indians for ceremonial and war paint, but today from the same sources used to make steel. Modern ore miners, emerging from the mines at the end of a day's work, are more completely covered with hematite dust than was any Indian in days yore.

★ ★ ★

MATTHEW J. DONACHIE, Works Manager of The Beryllium Corporation, followed with a talk on beryllium copper. He pointed out that copper wire was the earliest type known and made and that it had resisted all efforts to induce real hardness or give it high tensile strength until the discovery, about twenty years ago, that small quantities of beryllium could impart some unusual qualities to copper. Cold working and heat treating could produce tensiles up to 200,000 p.s.i., he said.

★ ★ ★

MR. DONACHIE called attention to the problems that made beryllium copper a delicate metal to heat treat, stating that it was possible to so heat it that no amount of subsequent treating could restore its usefulness once it had been "spoiled". The common wire alloys range from 1.9% beryllium to 2.1%. Higher alloys are possible in other forms than wire, like castings.

★ ★ ★

DURING the last war, production processes were virtually frozen, the Government preferring to adhere to known qualities and procedures, but since that time a great deal has been learned that has broadened and increased the utility of the alloy. The production of sound billets, he brought out, was a first consideration and this problem has become virtually routine. Among the interesting points mentioned is that work hardening resulting from drawing the wire materially reduces electrical conductivity, a factor that has to be considered in many applications. Hard drawn alloys may have only 17% conductivity, whereas spheroidized wire, without subsequent drawing, may run as high as 32%.

★ ★ ★

COPPER dissolves approximately 2% of beryllium at 1600°F. and proper heating and cooling can be made to produce many qualities for different end-uses. Cooling procedure is of great importance. It must be done quickly and with proper inert controlled atmospheres to prevent oxidation and to secure desirable grain structures.

★ ★ ★

THE meeting closed with the showing of a fine film entitled "Impregnated Paper Insulated Cables," provided to the Wire Association through the courtesy of the Okonite Company, of Passaic, New Jersey. This was a thorough exposition of the extreme care exercised at every step of the way from the stranding of wire, through paper coating, impregnation with waterproofing oils, through to the lead jacketing of the finished cables. Those privileged to see this motion picture secured a comprehensive impression of the materials and equipment used and the products produced at the Okonite plant.

★ ★ ★

IN lighter vein, Rod Tatnall read a telegram received by Mr. Brown, The Wire Association's Executive Secretary, just before the meeting. Bill and Fred Parkin, who had expected to attend, wired: "Best wishes for a successful meeting. Pressing pickling problems preclude Parkins' presence."

★ ★ ★

PROGRAM

Annual Convention of The Wire Association

La Salle Hotel, Chicago, Ill., October 17-20, 1949

Wire Association Headquarters at The La Salle Hotel
Will be Open from Monday, October 17, Every Evening During the Convention
— Come and Get Acquainted!

THERE WILL BE A REGISTRATION FEE OF $5.00 FOR THOSE ATTENDING THESE TECHNICAL SESSIONS AND INFORMAL MEETINGS

ADMISSION WILL BE BY BADGE ONLY

Discussions Will Be Held on the Papers Presented and These Discussions Will Be Published in the January, 1950, Issue of Wire and Wire Products

WIRE ASSOCIATION PROGRAM COMMITTEE FOR 1949 CONVENTION

La Salle Hotel, Chicago, Ill., Oct. 17-20, 1949

★ ★ ★

Fred M. Crapo, President
Indiana Steel & Wire Co., Muncie, Ind.
GENERAL CHAIRMAN

★ ★ ★

FERROUS DIVISION

A. E. Glen, Manager of Die Sales,
Carboloy Company, Inc.,
Detroit 32, Michigan, Chairman

MEMBERS

Wm. E. Hitchcock, Jr., Vice President
Atlantic Wire Company,
Branford, Conn.

James W. Galloway, Plant Engineer,
B. Greening Wire Co., Ltd.,
Hamilton, Ontario, Canada

Dartrey Lewis, Chief Engineer,
Development Engineering,
John A. Roebling's Sons Co.,
Trenton 2, N. J.

F. L. Hayden, Works Manager,
Steel Company of Canada, Ltd.,
334 Wellington St., No.,
Hamilton, Ontario, Canada

A. M. Reeder, Metallurgical Engineer,
Jones & Laughlin Steel Corp.,
Third & Ross Streets,
Pittsburgh 30, Penna.

H. B. Clark, General Manager
Vascoloy-Ramet Corp.,
800 Market Street,
Waukegan, Ill.

J. K. Findlay, Metallurgist,
Allegheny-Ludlum Steel Corp.,
Dunkirk, New York

NON FERROUS DIVISION

L. C. Whitney, Chief Metallurgist,
Copperweld Steel Company,
Glassport, Pennsylvania, Chairman

MEMBERS

E. P. Hall, Metallurgist
Kennecott Wire and Cable Company,
Phillipsdale, Rhode Island

C. J. Beneke, Manager,
Reynolds Metals Company, No. 7,
2500 S. Third St.,
Louisville, Ky.

Matthew J. Donachie, Metallurgist,
The Beryllium Corporation,
Reading, Penna.

J. H. DeKlyn, Works Manager,
Fabricating Division,
Aluminum Company of America,
Massena, New York

C. H. Hannon, Metallurgist,
Pittsfield Works Laboratory,
General Electric Company,
Pittsfield, Mass.

Dr. F. R. Morral, Associate Professor,
Department of Materials Engineering,
Syracuse University
Syracuse 10, New York

★ ★ ★

GENERAL ACTIVITIES

SMOKER-DINNER

Eber J. Hubbard, Jr., Vice President
Hubbard Spool Company
Chicago, Ill.

Richard E. Brown
Executive Secretary
THE WIRE ASSOCIATION
300 Main St., Stamford, Conn.

RESERVATIONS AND REGISTRATION

Mrs. Ruth S. Spengel, Secretary and Treasurer
WIRE AND WIRE PRODUCTS
300 Main St., Stamford, Conn.

All wire mill men and suppliers are invited to attend this meeting, see how the Association functions and participate in the activities.

All papers must be in the hands of the committee by July 1—and those selected will be preprinted in Wire and Wire Products October 1949 issue in advance of the meeting. Title to papers accepted will be given the Wire Association and duly copyrighted at time of publication. All papers are eligible for consideration for the Annual Medal Award.

Hotel reservations should be made by members of the Wire Association direct to the Secretary.
MAKE YOUR PLANS NOW TO ATTEND AND SEND YOUR RESERVATION PROMPTLY

MONDAY, OCTOBER 17

9:00 A. M.
REGISTRATION

10:30 A. M.
DIRECTORS' MEETING

12:30 P. M.
PROGRAM COMMITTEE LUNCH

— The Technical Sessions —

La Salle Hotel, Chicago, Ill., October 17-20, 1949 Inclusive.

MONDAY, OCTOBER 17 Morning Session—11 A. M.	A. F. Anjeskey Sales Manager Chairman of Meeting	Cleveland Tramrail Div. Cleveland Crane & Eng. Co. Wickliffe, O.
PAPER: "Handling Wire & Wire Products in the Mill"	by F. L. Hayden Works Manager	Steel Company of Canada Hamilton, Ont., Canada
PAPER: "Handling Wire & Wire Products in the Mill"	by J. W. Galloway Chief Engineer	B. Greening Wire Co., Ltd. Hamilton, Ont., Canada

MONDAY, OCTOBER 17 Afternoon Session—2 P. M.	Curtis Voigtlander Supt. Wire Mill Chairman of Meeting	Union Wire Rope Corp. Kansas City, Mo.
PAPER: "Plastic Strain & Hystresis in Drawn Steel Wire"	by R. S. Brown Chief Engineer	Rylands Brothers, Ltd. Warrington, England
PAPER: "Back Pull Wire Drawing"	by H. J. Godfrey Development Engineer	John A. Roebling's Sons Co. Trenton, N. J.

TUESDAY, OCTOBER 18 Morning Session—10:00 A. M.	R. S. Simmons General Metallurgist Chairman of Meeting	Keystone Steel & Wire Co. Peoria, Ill.
PAPER: "Continuous Cleaning"	by D. L. Doty Metallurgist	Jones & Laughlin Steel Corp. Aliquippa, Pa.
PAPER: "Processing of Stainless Steel Wire"	by S. P. Watkins Asst. to Gen. Mgr.	Armco Steel Corp. Baltimore, Md.

TUESDAY, OCTOBER 18
Afternoon Session—1 P. M.

THERE WILL BE A PLANT INSPECTION

TRIP TO

The Joliet Mills

American Steel & Wire Company

RESEARCH PAPERS ARE PREPRINTED IN THE OCTOBER ISSUE OF WIRE AND WIRE PRODUCTS

The Discussions and the Mordica Memorial Lecture will be printed in the January, 1950, issue of Wire and Wire Products

Papers not received in time for preprinting will be published in the November and December issues of Wire and Wire Products

— The Technical Sessions —

La Salle Hotel, Chicago, Ill., October 17-20, 1949, Inclusive

WEDNESDAY, OCTOBER 19

Morning Session—10:00 A. M.

E. J. Crum
General Foreman Wire Drawing
Chairman of Meeting
Bethlehem Steel Corp.
Sparrows Point, Md.

— SYMPOSIUM ON TUNGSTEN CARBIDE DIES —

Walter Schofield, Die Service Engineer
Carboloy Co.
Detroit, Mich.

E. T. Miller
Sales Eng. Dept.
Firth Sterling Steel & Carbide Corp.
McKeesport, Pa.

E. A. Henry
Die Engineer
Vascoloy-Ramet Corp.
Chicago, Ill.

E. R. Duthaler
Jones & Laughlin Steel Corp.
Aliquippa, Pa.

Art Hedman
Wickwire Spencer Steel Div., Colorado Fuel Iron Corp.
Buffalo, N. Y.

George Fecsen
Pittsburgh Steel Corp.
Pittsburgh, Pa.

by J. H. Corson
John A. Roebling's Sons Co.
Trenton, N. J.

WEDNESDAY, OCTOBER 19

1:00 P. M.

WIRE ASSOCIATION LUNCHEON—
THE MORDICA MEMORIAL LECTURE

Col. Allan B. Dove,
Superintendent
Dominion Works
Steel Company of Canada, Ltd.
Lachine, Quebec, Canada

— Presentation of the Wire Association Medal Award for 1948 —

(Members are at liberty to bring guests. Ladies are welcome)

WEDNESDAY, OCTOBER 19

Afternoon Session—3:30 P. M.

SYMPOSIUM ON DIAMOND DIES

Athos D. Leveridge,
Executive Manager,
Chairman of Meeting
Industrial Diamond
Association of America, Inc.
New York, N. Y.

WEDNESDAY, OCTOBER 19

Evening Session—7:00 P. M.

ANNUAL DINNER - SMOKER — HOTEL LA SALLE

Eber Hubbard, Jr., Vice President
Hubbard Spool Company, Chicago, Ill.
Chairman of Committee

THURSDAY, OCTOBER 20

Morning Session—10:00 A. M.

D. Boyd
Metallurgist
Chairman of Meeting
Northern Electric Co., Ltd.
Montreal, P.Q., Canada

PAPER:
"Protective Atmospheres for Annealing Non-Ferrous Wires"

E. G. deCoriolis, Dir. of Research and
Orville E. Cullen, Chf. Metallurgist
Surface Combustion Corporation
Toledo 1, O.

PAPER:
"New General Electric Company Copper Mill"

by F. A. Arnold
Wire Div. Eng.
General Electric Company
Fort Wayne, Ind.

THURSDAY, OCTOBER 20

Afternoon Session—2:00 P. M.

Bruce W. Gonser
Research Supervisor, Non Ferrous Metallurgy
Chairman of Meeting
Battelle Memorial Institute
Columbus 1, Ohio

PAPER:
"The Manufacture of Nickel and Monel Wires"

F. A. Bash
Asst. Vice Pres. and
Technical Director
Driver Harris Company
Harrison, N. J.

PAPER:
"Nylon Insulation"

C. A. Litzler
Chief Engineer
Industrial Ovens, Inc.
Cleveland, O.

PAPER:
"Application of Tin Coating in the Wire Industry"

(Tentative Title)
Metal & Thermit Corp.
New York, N. Y.

THE WIRE ASSOCIATION MEDAL AWARDS

For the Most Meritorious Paper on Wire Manufacture or Fabrication During the Year
— BY A MEMBER OF THE WIRE ASSOCIATION —

MEDAL AWARDS

1934 — EDWARD J. P. FISHER
Metallurgist, Keystone Steel & Wire Co., Peoria, Ill.
Title of Paper: "COLD DRAWN STEEL SPRING WIRE"

1935 — BENJAMIN LEWIS McCARTHY
Metallurgist, Wickwire Spencer Steel Co., Buffalo, N. Y.
Title of Paper: "GRAIN SIZE AND ITS INFLUENCE ON THE MANUFACTURE OF STEEL WIRE"

1936 — ROBERT NOTVEST
Chief Engineer, Welding Division, J. D. Adams Mfg. Co., Indianapolis, Ind.
Title of Paper: "STEEL FOR ARC WELDING ELECTRODES"

1937 — BENJAMIN LEWIS McCARTHY
Chief Metallurgist, Wickwire Spencer Steel Co., Buffalo, N. Y.
Title of Paper:
"ABNORMAL GRAIN GROWTH AND THE ANNEALING OF LOW CARBON STEEL WIRE"

1938 — WALTER R. BLOXDORF
Metallurgist, The MacWhyte Co., Kenosha, Wis.
Title of Paper: "WIRE ROPE"

1939 — STANLEY P. WATKINS
Manager, Sales Development, Rustless Iron and Steel Corp.
Baltimore, Maryland
Title of Paper:
"THE MANUFACTURE AND USE OF STAINLESS STEEL WIRE"

1940 — ROBERT W. SANDELIN
Metallurgist, Atlantic Steel Company, Atlanta, Georgia
Title of Paper:
"GALVANIZING CHARACTERISTICS OF DIFFERENT TYPES OF STEEL"

1941 — CARLETON W. GARRETT
Wire Mill Metallurgist, Jones & Laughlin Steel Corp.
Aliquippa, Pennsylvania
Title of Paper:
"A BRIEF DISCUSSION ON THE MANUFACTURE OF STEEL FOR ARC WELDING ELECTRODES"

1942 — LE ROY DEVOE SEYMOUR
Asst. Works Manager, Canada Works, Steel Company of Canada, Ltd., Hamilton, Ontario, Canada
Title of Paper:
"SCHEDULING AND PLANNING THE WIRE MILL FOR WAR PRODUCTION"

1943 — JOHN C. AIKEN
Asst. Supt., Rod and Wire Mills, Jones & Laughlin Steel Corp., Aliquippa, Pennsylvania
Title of Paper: "DRAWING HIGH SPEED ROPE WIRE"

1944 — AUGUST R. ZAPP
Manager, Carbide Division, Firth-Sterling Steel Company, McKeesport, Pa.
Title of Paper:
"HISTORY AND GROWTH OF THE TUNGSTEN CARBIDE DIE"

1945 — MATTHEW J. DONACHIE
Technical Director of Production, Beryllium Corporation, Reading, Pa.
Title of Paper:
"SOME TRAITS AND CHARACTERISTICS IN THE WORKING OF BERYLLIUM—COPPER WIRE"

1946 - 1947 — No awards

1948 — REGINALD S. BROWN
Chief Metallurgist, Rylands Brothers, Ltd.
Warrington, England
Title of Paper: "WEAR RESISTANCE OF WIRE FOR ROPE WIRE"

HONORABLE MENTIONS

1935 — L. D. SEYMOUR
Metallurgist, Rod and Wire Dept., Youngstown Sheet & Tube Co., Youngstown, Ohio
Title of Paper: "COLD HEADING WIRE"

1935 — R. A. SCHATZEL
Superintendent, General Research Laboratories, General Cable Corp., Rome, N. Y.
Title of Paper: "HARD AND SOFT COPPER WIRE"

1936 — BENJAMIN LEWIS McCARTHY
Metallurgist, Wickwire Spencer Steel Co., Buffalo, N. Y.
Title of Paper: "PLASTIC DEFORMATION IN WIRE DRAWING"

1937 — ROBERT W. SANDELIN
Metallurgist, Atlantic Steel Co., Atlanta, Ga.
Title of Paper:
"A METALLURGICAL STUDY OF THE FACTORS AFFECTING THE QUALITY OF GALVANIZING"

1937 — ALAN B. DOVE
Chemical Engineer, Canada Works, The Steel Company of Canada, Ltd., Hamilton, Ont., Canada
Title of Paper:
"A. C. ELECTRO PICKLING—A BETTER METHOD OF PICKLING"

1938 — RODMAN R. TATNALL
Metallurgist, Morgan Works, Spencer Steel Co.
Worcester, Massachusetts
Title of Paper: "RESILIENCE OF SPRINGS"

1939 — JOSEPH A. DOYLE
Vice President, W. S. Rockwell Co., New York, N. Y.
Title of Paper: "HEATING COPPER WIRE BARS"

1940 — H. BLOUNT and J. D. WILTRAKIS
Mfg. Engineer, Point Breeze Works, Engineer, Kearny Works, Western Electric Company
Title of Paper:
"DESIGN AND OPERATION OF A NEW COPPER WIRE DRAWING PLANT"

1941 — RODMAN R. TATNALL
Metallurgist, Morgan Works, Wickwire Spencer Steel Co., Worcester, Massachusetts
Title of Paper:
"TIME, TEMPERATURE AND SIZE IN THE HEATING OF STEEL WIRE"

1942 — COLONEL FRANK W. BULLOCK
Signal Corps, United States Army
Title of Paper: "THE WIRE INDUSTRY IN WAR"

1943 — E. J. CRUM
General Foreman, Bethanizing and Galvanizing Departments, Bethlehem Steel Company, Sparrows Point, Md.
Title of Paper:
"THE GRAPHICAL SOLUTION OF WIRE MILL MATHEMATICAL PROBLEMS"

1944 — FERNALD S. STICKNEY
Vice President and Chief Engineer, Instrument Specialties Company, Little Falls, N. Y.
Title of Paper: "MAKING 'SPRING-GRADE' BERYLLIUM COPPER WIRE"

1945 — RALPH C. ELLAMS
Supervisor, Electrical Coating Development
Roxalin Flexible Finishes, Inc., Elizabeth, N. J.
Title of Paper:
"SUCCESSFUL FINISHING OF ELECTRICALLY INSULATED WIRE AND CABLE"

1945 — D. A. SUTCH, Metallurgist,
and B. L. McCARTHY, Chief Metallurgist,
Wickwire Spencer Steel Co., Buffalo, N. Y.
Title of Paper:
"REDUCTION OF AREA VALUES AS A GUIDE TO PATENTING"

1946 — No awards
1947 — No awards

1948 — C. A. ZAPFFE, Consulting Metallurgist and
M. E. HASLAM, Research Chemist
Baltimore, Md.
Title of Paper:
"EVALUATION OF PICKLING INHIBITORS FROM THE STANDPOINT OF HYDROGEN EMBRITTLEMENT"

1948 — CHRISTIAN WITTEVELD
Process and Development Engineer, Bridgeport Brass Company, Bridgeport, Conn.
Title of Paper: "BRASS WIRE PROCESSING"

GOVERNMENT WIRE PRODUCTION INFORMATION

Government Offers New Technical Reports

A NEW subject index and abstract collection of more than one thousand unclassified scientific and technical reports prepared by the Combined Intelligence Objectives Subcommittee and dealing with European technology may now be obtained from the Office of Technical Services of the Department of Commerce.

★ ★ ★

OF interest to librarians and technical research workers, this publication of the Joint Chiefs of Staff is the first of a series of such volumes. They eventually will include reports of the British Intelligence Objectives Subcommittee (B.I.O.S.) and Field Intelligence Agency Technical (F.I.A.T.) as well as a group of minor reports all dealing with the technical findings of Allied investigators in Germany and occupied Europe since the war.

★ ★ ★

THE current volume lists reports in 33 major categories and some 80 additional subcategories. Reports with broad importance are listed under more than one category. C.I.O.S., B.I.O.S., F.I.A.T. and other declassified European technical reports are available to the public from the Office of Technical Services.

★ ★ ★

PB 96941, J.I.O.A. Subject Index: C.I.O.S. Volume I., 270 pages, sells for $3.00 per copy. Orders should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D. C., and should be accompanied by check or money order payable to the Treasurer of the United States.

★ ★ ★

Report Bibliography Issued by Department of Commerce

A SUBJECT index to technological documents issued in Volume X of the **Bibliography of Scientific and Industrial Reports** is now available to the public, the Office of Technical Services of the Department of Commerce has announced.

★ ★ ★

THE new index enables researchers to locate reports on any subject carried by the **Bibliography** in the period July-Decem-

MICROMETER PRECISION MICRO-WELD TRADE MARK REG. U. S. PAT OFF.

MODEL H-T MICRO-WELD HEAVY BUTT WELDER

A general utility Butt welder for welding Steel (low carbon rods and wire ranging in size from 1/8" to 7/8" diameter.

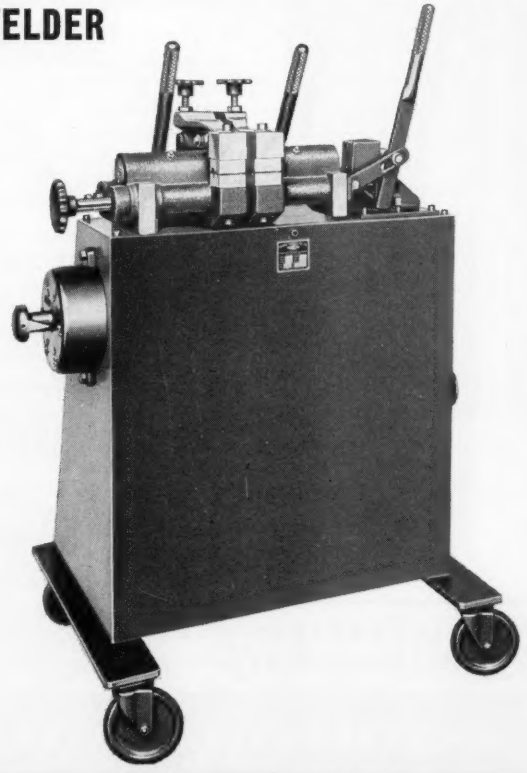
While this unit was not designed for production line work, the wide range in welding capacity makes it suitable for various types of welding requirements.

Equipped with hand-operated toggle type clamping mechanism, providing positive clamping of the stock.

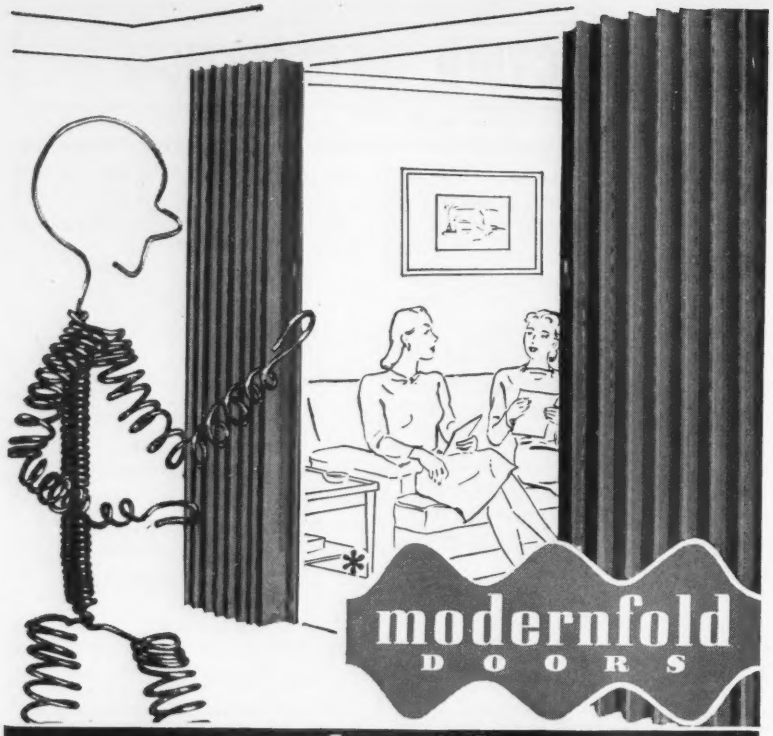
Spring actuated movable welding headpiece and close coupling of the transformer provides high efficiency on the welding current.

General construction of this unit is rugged to resist high upsetting forces, and to maintain accurate alignment of the work.

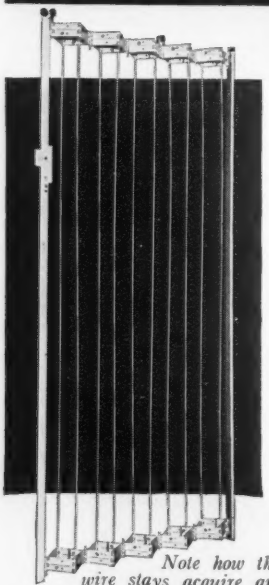
Furnished mounted on 4-wheel truck as illustrated.



MICRO PRODUCTS COMPANY
20 NORTH WACKER DRIVE
CHICAGO 6, ILL.
Telephone: State 2-7468



made with
KEYSTONE WIRE



Modernfold Doors are a revolutionary type of folding wall . . . with a smooth, trouble-free, accordion-like operation.

A framework of vertical stays made of Keystone galvanized wire forms a firm foundation to which colorful fabrics are attached. The wire stays give added strength and rigidity to the accordion-like construction and play an important part in the patented hinge-action at top and bottom.

Modernfold Doors are the work of master craftsmen. All materials used in their construction are rigidly tested . . . with special emphasis on quality. That's why rust-resisting Keystone galvanized wire is specified.

Keystone wire is a recognized factor in the unique and practical construction of these modern closures.

Note how the Keystone wire stays acquire an accordion-like action from the precision-built hinge-plate.

* *New Castle Products* *New Castle, Ind.*

KEYSTONE
MUSIC SPRING WIRE

SPECIAL ANALYSIS WIRE for all industrial purposes

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

ber, 1948. Subject headings are comprehensive and include trade names where appropriate, O.T.S. said.

* * *

COPIES of the Index have been sent to subscribers to the **Bibliography** as part of their current issue. Others may purchase it from the Office of Technical Services, Department of Commerce, Washington 25, D. C., at $1 per copy.

* * *

ALSO available are Indexes to previous volumes of the **Bibliography** at the following prices: Volume I, 50 cents; Volume II, 35 cents; Volume III, 35 cents; Volume IV, 45 cents, and Volume V, 55 cents. Indexes were not prepared for Volumes VI through IX.

* * *

THESE earlier Indexes should be purchased from the Superintendent of Documents, Washington 25, D. C.

* * *

THE **Bibliography of Scientific and Industrial Reports,** now issued monthly, lists additions to the O.T.S. collection of foreign and domestic technical reports. The collection now totals some 125,000 items. Information on the contents of the collection in any particular field may be secured by writing to the Office of Technical Services, Department of Commerce, Washington 25, D. C.

* * *

Ajax Electric Moves Plant to New and Larger Quarters

THE AJAX ELECTRIC COMPANY, INC., Philadelphia Pennsylvania, has moved its manufacturing facilities to a new plant located at Tioga & Melville Streets in Philadelphia.

* * *

THE building is designed to produce an increased volume of Ajax-Hultgren Salt Bath Furnaces —both the standard batch types and the pre-assembled mechanized units. A unique feature of this new plant is a long, high bay equipped

with three travelling cranes of 5, 10 and 15 ton capacities. The runways are arranged one above the other, so that a maximum lift of 30 tons is available for loading equipment directly onto railroad cars.

★ ★ ★

THE Ajax business office is still located at Frankford and Delaware Avenues, Philadelphia.

★ ★ ★

New Cable Being Made by Western Electric

A NEW cable, unusual in its covering, is being manufactured by the **Western Electric Company,** Called the "Alpeth" cable, it is the result of extensive research by the Bell Telephone Laboratories and manufacturing developments by Western Electric.

★ ★ ★

THE cable is comprised of a core of copper conductors individually insulated with paper. This core is spirally wrapped with paper, covered with a thin corrugated aluminum sheath and finally with a relatively thick polyethylene jacket that is applied by extrusion.

★ ★ ★

THE aluminum sheathing was chosen because of its good conductivity. It is wound on with overlapping edges, with an applied adhesive to seal the overlaps. Another compound is flooded over the entire outer surface of the aluminum, which further shields the inner conductors from moisture and outside electrical interference.

★ ★ ★

THIS double sealing, together with the high resistance to water diffusion offered by the polyethylene jacket, keeps the paper dry, an essential condition to this type of conductor.

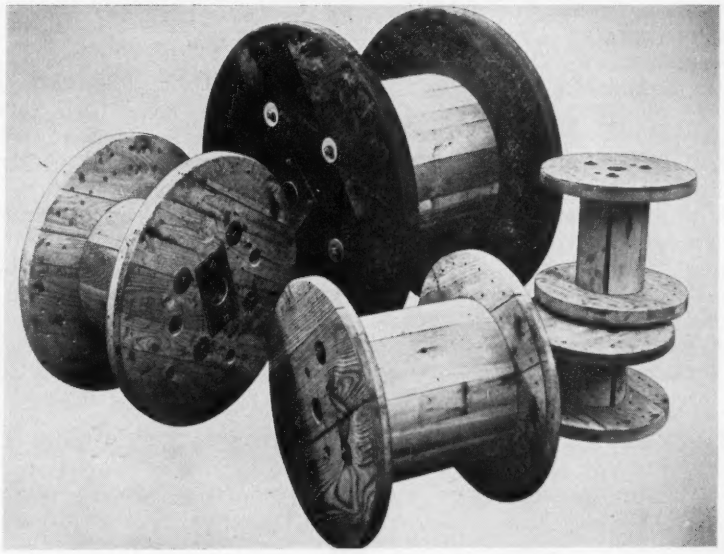
★ ★ ★

THE cable is designed for either aerial or duct use and has been found to have desirable characteristics in lightness, ease of handling and abrasion resistance.

★ ★ ★

REELS made of

RETURNABLE AND NON-RETURNABLE **WOOD**



Bridge SHIPPING and SHOP REELS are furnished assembled or knocked down, made to your specifications. Built to withstand severest handling. Sturdy, strong, low in cost. Made for

CABLE, ROPE and WIRE

Made in any size, from 12" to 96" in diameter.

ALSO, REEL HEADS FOR STEEL DRUMS

Send us your specifications and let us quote on costs.

BRIDGE MFG. CO., Inc.

HAZARDVILLE • CONNECTICUT

Outstanding Personalities of the Wire Industry

Fiberglas Changes to Divisional Basis

CHANGES in the organization of **Owens-Corning Fiberglas Corporation** to effect a divisional basis of operation, and resulting re-assignments of key personnel, were announced by Harold Boeschenstein, president.

★ ★ ★

EFFECTIVE April 1, a General Products Division at the firm's main offices in Toledo, and a Textile Products Division, headquartered at the Fiberglas Building, New York City, were established. A Pacific Coast Division, headquartered at Santa Clara, Calif., was established last year.

★ ★ ★

W. P. ZIMMERMAN, in addition to his duties as Fiberglas executive vice-president, was named general manager of the General Products Division. **J. H. Thomas,** vice-president, was appointed general manager of the Textile Products Division. **L. R. Kessler** is general manager of the Pacific Coast Division.

★ ★ ★

HERETOFORE, Fiberglas sales programs have been carried on in eight sales sections, which will be re-grouped. To be transferred to the Textile Products Division are the electrical section, headed by **R. J. Black,** and the plastics section, headed by **Ralph Perkins.** These sections will be joined with the present textile sales program in the new Textile Products Division.

★ ★ ★

THROUGH B. E. **Boyd,** vice-president for manufacturing, Mr. Zimmerman will be responsible for operation of the Fiberglas plants at Newark, Ohio, and Kansas City, Kansas. Managers of the Fiberglas textile plants at Ashton, R. I., and Huntingdon, Pa., will report to Mr. Thomas.

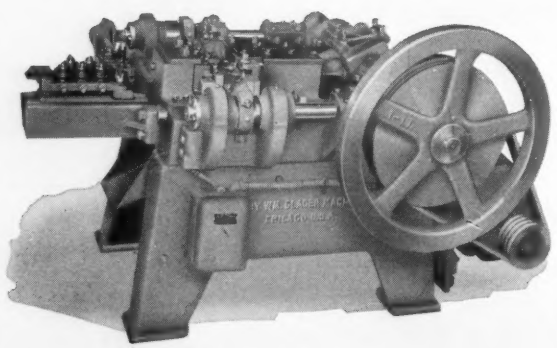
★ ★ ★

GENERAL staff departments, which will remain in Toledo and report to Mr. Boeschenstein through Mr. Zimmerman, are headed by Ben S. Wright, general sales manager; H. W. Taft, director of purchases; H. R. Hogendobler, chief engineer; Walter C. Skuce, manager of the organization and methods department; D. A. O'Neill, personnel director; and A. C. Wilson, manager of the product control department.

★ ★ ★

BESIDES functioning as general sales manager responsible for administration of the Fiberglas

GLADER HIGH SPEED WIRE NAIL MACHINE



MACHINE ARRANGED FOR INDIVIDUAL MOTOR DRIVE

High tonnage output, and low maintenance costs, have resulted in Glader Machines being accepted as standard equipment in every large nail mill built in the United States in the past twenty years.

Glader Machines are operating in most of the wire producing mills throughout the world.

These machines are made in eleven different types and sizes. This enables us to cover the range of sizes of nails produced with the greatest efficiency.

For further information please address,

WM. GLADER MACHINE WORKS
210 No. Racine Ave.
Chicago 7, Illinois

Export Dept.: 122 E. 42nd Street, New York 17, N. Y.

branch offices serving all the company's operating divisions, Mr. Wright will act as sales manager of the General Products Division. A. R. Smith is general purchasing agent of the General Products Division.

★ ★ ★

IN addition to Mr. Zimmerman, Mr. Thomas and Mr. Kessler, the announcement listed as responsible directly to Mr. Boeschenstein: H. R. Winkle, vice-president and treasurer; James Slayter, vice-president in charge of research and development; Carl G. Staelin, secretary of the corporation and manager of its legal and patent department; Edward C. Ames, public relations manager; and W. H. Curtiss, Jr., administrative assistant.

★ ★ ★

G. E. Appointments

JAMES W. RAYNOLDS, former vice-president and director of the Sun Chemical Company of New York, has joined the **General Electric Company's** Chemical Department as sales manager of silicone products, according to an announcement today by John A. Zellhoefer, Chemicals Division sales manager. With headquarters at Waterford, N. Y., Mr. Raynolds will have commercial responsibility for G-E silicone gum, oils, emulsions, greases, resins, and water repellents.

★ ★ ★

AUTHOR of several technical articles and holder of 36 patents in the chemical field, Mr. Raynolds served with the War Production Board during World War II as assistant director of the chemical bureau, in charge of plastics, protective coatings, drugs, and other materials.

★ ★ ★

J. S. OVERSTREET has been made manager of sales in the Wire & Cable Div., Construction Materials Dept., General Electric, Bridgeport, Conn. **R. P. Allison** has been appointed manager of manufacturing of that division. He joined the company in 1935 and since then has been a methods engineer and has held the position of works manager of the Poughkeepsie and Lowell plants. **C. O. Hull** has been appointed manager of Bridgeport engineering of the division. He has served the company since 1922. **V. A. Sheals** has been made manager of Schenectady engineering. He has been with the company since 1921. **E. N. Kimball, Jr.,** has been made manager of the procedures division. Mr. Kimball has been with GE since 1947.

★ ★ ★

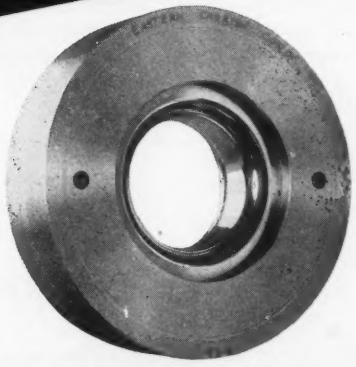
A. S. & W. Research Laboratory Changes

RONALD E. GRIFFITHS, for three years supervisor of the **American Steel & Wire Company** research laboratory in Cleveland, has been appointed assistant director of research for the Company, according to H. B. Jordan, vice-president-operations of the U. S. Steel subsidiary.

★ ★ ★

Only HYPREZ Can Do a HYPREZ Job!

IN FINISHING WIRE DIES AND TOOLS



On thousands of jobs, difficult and simple, HYPREZ DIAMOND COMPOUNDS have demonstrated their quality, uniformity, speed and economy. Twenty-six engineered standards perfected by our laboratories offer you the exact grades for a complete and perfect job—from rough finish to mirror polish.

HYPREZ DIAMOND COMPOUNDS are formulated of precision-graded, fast-cutting virgin diamond powder in a special base that will "stick to the job" and which is stable and uniform at all normal temperatures.

Die illustrated produced by Eastern Carbide Corp., New Rochelle, N.Y.

Write For This Free Folder

Illustrating proven Hyprez techniques. HYPREZ DIAMOND COMPOUNDS are available in 30, 18 and 5-gram cartridges—fully color-identified and dust proof—for use with the original Hyprez Applicator Gun.

For this folder or for a free demonstration write to Dept. W-649.

HYPREZ DIAMOND COMPOUNDS

AN EXCLUSIVE PRODUCT OF

HYPREZ DIVISION

ENGIS EQUIPMENT CO., 431 S. DEARBORN ST. CHICAGO

MR. GRIFFITHS has been associated with American Steel & Wire in various technical assignments since June, 1937. In his new post, as assistant to **Walter O. Everling,** director of research, he succeeds Willis T. Cramer, who has been transferred to the post of division metallurgist, for corrosion-resisting alloys, in the Company's metallurgical department.

★ ★ ★

SUCCEEDING Mr. Griffiths as supervisor of the research laboratory, which is located at the Company's American Works, 1230 Marquette Road, is **Roland O. Hartman,** a member of the research staff since June, 1936.

★ ★ ★

Recent Roebling Appointments

CHARLES R. TYSON, president of **John A. Roebling's Sons Company,** Trenton, N. J., manufacturers of wire products, announces the appointment of **Herbert D. Rathbun** as secretary and treasurer of the company. He succeeds **Archibald W. Brown** to the latter position. Brown, who recently retired after 47 years service, continues as a member of the board of directors.

★ ★ ★

RATHBUN, a native of Rochester, N. Y., has been associated with the Roebling Company since 1938. He is a graduate of Hamilton and Pace Colleges, and an active member of the National Association of Cost Accountants, National Association of Manufacturers and the Controllers Institute of America.

★ ★ ★

TYSON also announced the appointment of **Clarence W. Snyder** as comptroller and assistant secretary and **H. Russell Brown** as assistant treasurer and assistant secretary.

★ ★ ★

BORN in Marion, Ohio, Snyder is a graduate of Ohio State University and has been associated with Roebling since 1940. He is a member of the National Association of Cost Accountants, serving at present as vice-president of the Philadelphia Chapter and is also active in the Controllers Institute of America.

★ ★ ★

H. RUSSELL BROWN the newly-named assistant treasurer, has been with the company since 1935 and has been serving as general accountant and assistant secretary. He was born in Pittsburgh and was graduated from John B. Stetson University, Deland, Florida.

★ ★ ★

Firth Sterling Names New Manager, Distributor Sales

THE appointment of **Jack W. Crawford** to the position of Manager of the newly created Distributor Sales Division is announced by **Gil B. Richards,** General Sales Manager, Firth Sterling Steel and Carbide Corporation, McKeesport, Pennsylvania.

★ ★ ★

The **SPECIALISTS** in
Wire-Straightening and Wire-Cutting!

Diameter Range — 1/16" to .005"

PRECISION - Our Motto

DON'T hesitate to call on us when you are confronted with wire-straightening problems involving close tolerances and absolute accuracy. For seventeen years we have specialized in straightening and cutting all gauges of fine wire, hard or soft, ranging in diameter from one-sixteenth of an inch down to five-thousandths of an inch. We employ gun-barrel accuracy in straightening lengths from one inch to ten feet or any fractional part thereof. Ends cut absolutely clean without burrs.

ASK ABOUT OUR UNEXCELLED FACILITIES FOR CLEANING AND POINTING WIRE ALREADY STRAIGHTENED AND CUT.

ALL TYPES OF WIRE...

- Nickel
- Stainless Steel
- Bronze
- Brass
- Copper
- Alloy Wire
- Music Wire
- Tag Wire
- Florist Wire

Write us today!

Manufacturers of the famous ARMA PAPER CLIP

PITTSBURGH CUT WIRE COMPANY
1112-20 GALVESTON AVENUE · PITTSBURGH, PENNSYLVANIA.
TELEPHONE: CEdar 4702

IN 1948, Firth Sterling began to sell certain of its steel and carbide products through industrial supplies distributors. The Company plans to expand its distributor sales plans and increase its distributor representation as rapidly as new distributors can be secured in principal cities.

* * *

J. E. Williams, Supt. Struthers Rod & Wire Works of Youngstown Sheet & Tube Company.

Appointments Made by Youngstown Sheet and Tube Company

YOUNGSTOWN SHEET AND TUBE COMPANY announce that in the Rod and Wire Mill Division **John D. Anderson** of Youngstown has been appointed assistant superintendent of the Rod, Wire and Conduit Departments at the Struthers Ohio plant.

* * *

JOSEPH EMRYS WILLIAMS, formerly of Sterling, Illinois has been appointed Superintendent of the Struthers Rod and Wire Works, succeeding **J. H. Shilling** who retired.

* * *

PHILIP G. (JERRY) BOYD has been appointed Chicago District Sales Manager succeeding **Arthur Purnell** who recently died.

* * *

JOHN P. FEAGLEY has been made District Sales Manager in charge of the Company's New York office succeeding **Lew E. Wallace** who recently was transferred to Youngstown as General Manager of Sales.

* * *

John D. Anderson, Asst. Supt. Rod, Wire & Conduit Depts., Youngstown Sheet & Tube Co. Struthers Ohio Plant.

Controlled

OPERATING TEMPERATURES TO 650° F

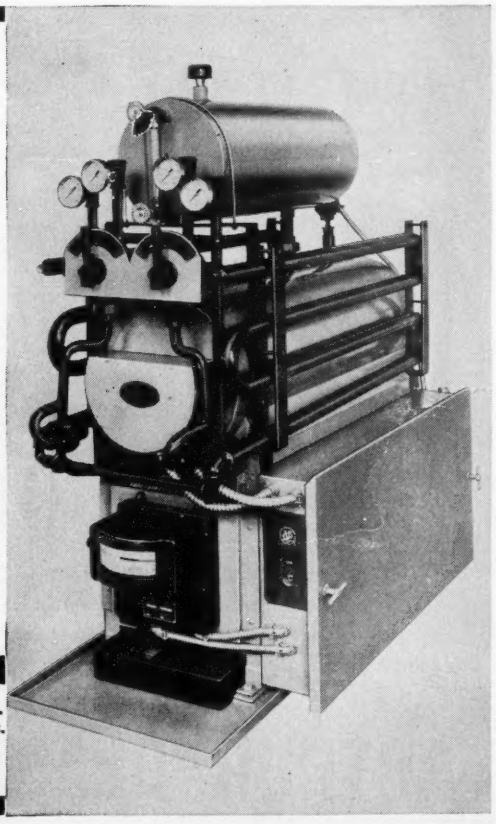
The Royle Temperature Control Unit is designed to eliminate uncertainty in extrusion and other industrial processes which require accurate and constantly maintained operating temperatures of extended periods of time. This compact and simply operated unit will supply—or drain—heat in accordance with process specifications as established by laboratory experiments. Features are built into the self-contained Royle Temperature Control Unit to assure maximum results with a minimum of maintenance.

WRITE FOR COMPLETE DETAILS

JOHN ROYLE & SONS ROYLE PATERSON N. J.

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN 1880

London, England	Home Office	Akron, Ohio	Los Angeles, Cal.
James Day (Machinery) Ltd.	E. B. Trout J. W. VanRiper	J. C. Clinefelter	H. M. Royal, Inc.
REgent 2430	SHerwood 2-8262	JEfferson 3264	LOgan 3261



Berton Sharpe to Represent Surface Combustion

THE Standard Furnace Division, **Surface Combustion Corporation,** Toledo 1, Ohio, announces the appointment of **Berton M. Sharpe** as sales engineer to cover the territory of southern Indiana, southwestern Ohio and northern Kentucky.

★ ★ ★

MR. SHARPE has studied mechanical engineering at Ohio State University, and aerodynamics at the University of Southern California. Since joining Surface Combustion Corporation in February, 1937, he has been engaged in engineering and service work in the industrial, aircraft, and space-heating fields.

★ ★ ★

Carl J. Murray, Plant Manager Buffalo Works

CARL J. MURRAY has been appointed Plant Manager of the **Wickwire Spencer Steel Division,** Buffalo Works, it was announced by **J. S. Hawley,** assistant to **A. F. Franz,** Executive Vice-President of The Colorado Fuel and Iron Corporation. Mr. Murray was previously with the Jessop Steel Company as General Superintendent and before that he was Plant Engineer with the Crucible Steel Company of America. He assumed his duties as of April 1.

★ ★ ★

MR. HAWLEY also announced the appointment of **Duncan S. Cameron** as open hearth superintendent. Mr. Cameron has had long experience in the work with Pacific States Steel, Kaiser and Republic.

★ ★ ★

Du Pont Makes Changes in Electrochemicals Department

THREE personnel changes in the Technical Division of the **Du Pont Company's Electrochemicals Department** were announced in April.

★ ★ ★

DR. PAUL R. AUSTIN, an assistant director of the Chemical Department laboratory at Du Pont's Experimental Station here, was appointed director of the Electrochemicals Department's Technical Division.

★ ★ ★

DR. HAROLD J. BARRETT, chemical research manager at the Niagara Falls, N. Y., plant was named manager of field research with headquarters here.

★ ★ ★

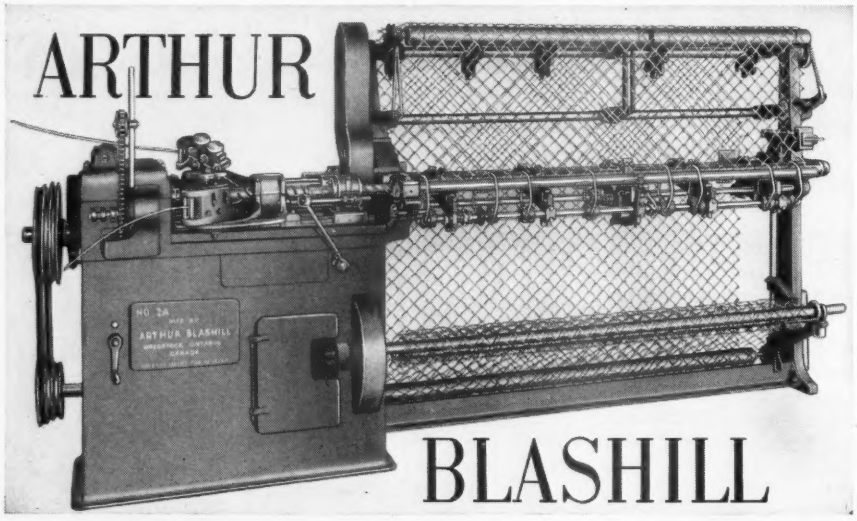
DR. CAMPBELL ROBERTSON, manager of chemical research at the Perth Amboy, N. J. plant, was named chemical research manager at the Niagara Falls plant.

★ ★ ★

THE appointments became effective as of May 1st.

★ ★ ★

DR. EARLE A. HARDINGS, who has been director of the Techni-



The New No. 2A.
CHAIN-LINK FENCE MACHINE
CANADIAN 1949 MODEL

After 15 years' efficient service — now improved still more.

Proof of superiority — Most of our orders are "repeats" and they waited since the war for them.

No. 2 A. just can't be beaten — It runs its "twin spirals" at top speed and pauses ¾ second only for cut-off, advance and "knuckling."

Forming and "weaving-in" the Spirals goes on nearly full time.

Result — 30% to 50% MORE OUTPUT. Handier too — just a step to the fence roll.
Small space — only three feet wide. Low power — all ball and roller bearings.
Low maintenance — built to machine tool standards.
Designed and built by a Canadian with many years in wire fence and fence machine building, in Canada, U. S. A. and England.

ARTHUR BLASHILL

Now at Woodstock, Ontario
CANADA
(Till recently operating at Birmingham, England)

cal Division, and **Paul J. Carlisle,** who has been manager of field research will retire from active service about the end of this year. Until that time they will serve as special assistants to their successors.

★ ★ ★

Stewart Iron Works Opens Indianapolis Branch

AN Indianapolis branch office in the Test Building under managership of **Don L. Merrill,** has been opened by the **Stewart Iron Works Co.,** Cincinnati, Ohio. **Stanley M. Stewart,** president of the company, states that Merrill will be in charge of its sales operations in Indiana as well as portions of Illinois and Kentucky.

★ ★ ★

MERRILL, formerly president of the Merrill & McKinney Fence Co., Inc., Indianapolis, has had 15 years in the fence business. His office will specialize in industrial, residential and all types of institutional iron and chain link wire fence. A complete sales and erection service will be provided.

★ ★ ★

Gibbons Becomes Manager of Resistance Wire Sales for Jelliff

JOSEPH C. GIBBONS has been appointed manager of resistance Wire Sales for the **C. O. Jelliff Manufacturing Corporation** Southport, Connecticut, and began his duties there on May 2nd. He will devote his abilities to co-operating with the many users of Jelliff's extensive and well known line of electrical-resistance alloys, and to the expansion of their present market.

★ ★ ★

MR. GIBBONS will be remembered as former Sales Manager of The Wilbur B. Driver Co. of Newark, New Jersey, and he has a wide acquaintance and experience in the electrical and electronic fields in which Jelliff resistance wires are used.

★ ★ ★

Wean Equipment Corporation Elects Directors and Officers

AT a meeting of the stockholders at the Wean Equipment Corporation held at its offices at 22800 Lakeland Boulevard, Cleveland, Ohio, the following directors were re-elected: S. R. Wean, R. J. Wean, R. J. Wean, Jr., H. W. Lynn, D. A. McArthur and J. R. Paisley.

★ ★ ★

AND, officers were also re-elected as follows: R. J. Wean, Jr., President and Treasurer; J. R. Paisley, Vice-President, General Manager and Assistant Treasurer; G. J. Ridgeway, Secretary, and L. R. Connor, Assistant Secretary.

★ ★ ★

THE Company manufactures wire mill, narrow strip, tube mill and fence machinery and also is a manufacturer of machinery for the Wean Engineering Company, Inc., in Warren, Ohio.

★ ★ ★

No. 1155 Farm and Field Fence Machine
Barbed-Wire Machine
Strip Reel and Slitting Unit
16 Block Wire Galvanizing Take-Up Frame
Entry End of Tube Straightener

Wean Equipment Corporation
CLEVELAND, OHIO

THE WEAN EQUIPMENT CORPORATION are recognized as specialists in high-efficiency and wire mill and straightening equipment.

COLD ROLLING MACHINERY

For 36" Wide Material and Narrower

MILLS - REELS - SLITTERS - LEVELERS
COILERS - EDGERS - SCALE BREAKERS - SHEARS
SCRAP BALLERS - CONTINUOUS PICKLING

WIRE MILL EQUIPMENT

PATENTING, GALVANIZING AND TINNING TAKE-UP FRAMES
WIRE FLATTENING MILLS - SPOOLERS - NAIL GALVANIZING
AND BLUEING EQUIPMENT - FIELD FENCE AND
BARBED WIRE MACHINES

TUBE BAR AND SHAPE STRAIGHTENING MACHINERY

WEAN EQUIPMENT CORPORATION
22800 LAKELAND BLVD. • CLEVELAND, OHIO

A Review of Recent Wire Patents

NO. 2,466,227, COIL WINDING MACHINE, patented April 5, 1949 by George W. Gilman, Janesville, and Gordon F. Laing and Thomas B. Gibbs, Delavan, Wis., assignors to The George W. Borg Corporation, Chicago, Ill., a corporation of Delaware.

There are 39 claims. The machine includes an apparatus for spacing the turns of wire of the coil apart as the coil is wound to produce a predetermined varying spacing and which is readily interchangeable with a similar apparatus adapted to produce a different predetermined varying spacing.

★ ★ ★

NO. 2,466,285, NICKEL-IRON ALLOYS ADAPTED FOR SPRINGS IN THERMOCOMPENSATED OSCILLATING SYSTEMS, patented April 5, 1949 by Reinhard Straumann, Waldenburg, Canton of Bale-Campagne, Switzerland.

It is claimed the temperature running curve of the system will be rendered practically rectilinear in ranges between 0° and 50°C., by employing an alloy containing nickel 25 to 40%, beryllium 0.5 to 2%; titanium 0.5 to 2%; carbon 0.2 to 0.8%; silicon and manganese together 1%, in addition to at least one of the metals of the group consisting of molybdenum, chromium and tungsten, the total content of the metals of this group amounting to 5 to 12%, and the remainder of the alloy being iron.

★ ★ ★

NO. 2,466,530, PROCESS FOR PREVENTING CORROSION AND CORROSION INHIBITOR, patented April 5, 1949 by Charles M. Blair, Jr., Webster Groves, and William F. Gross, Kirkwood, Mo., assignors to Petrolite Corporation, Ltd., Wilmington, Del., a corporation of Delaware.

In this process, the inventors apply to the metal surface a N-aliphatic 2,5 pyrrolinedione; the aliphatic radical containing at least 7 and not more than 32 carbon atoms. There are also claims to the product.

★ ★ ★

NO. 2,466,850, COMBINED PAINTBRUSH HOLDER AND WIPER, patented April 12, 1949 by Marian I. Hoffman and Lambert M. Meidinger, Bay City, Mich.

This holder is constructed wholly of bent wire.

★ ★ ★

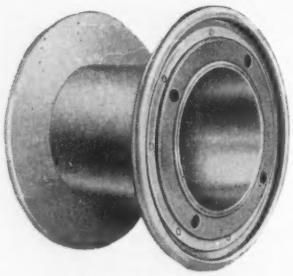
NO. 2,466,977, MACHINE FOR WINDING CAPACITORS, patented April 12, 1949 by Felix Weiss, Brookline, Mass., assignor to Cornell-Dubilier Electric Corporation, South Plainfield, N. J., a corporation of Delaware.

More specifically there is provided a counter mechanism for measuring the revolutions of a mandrel, a device for continuously measuring the diameter of the body being wound on the mandrel, a device actuated by the counter to stop the mandrel at the end of a predetermined number of turns, and a device actuated by the diameter measuring a device to stop the mandrel when the body wound thereon has reached a predetermined diameter, the device actuated by the counter, and the device actuated by the diameter measuring device operating independently to stop the mandrel.

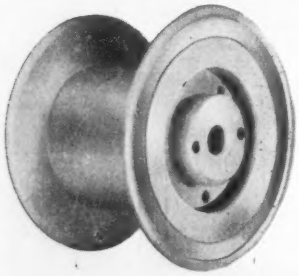
★ ★ ★

NO. 2,467,072, MEANS FOR MAKING WOVEN WIRE OR SCREEN

Complete Description and Drawings of Patents May Be Had for 50 cents, outside the United States and Canada $1.00. Address, Wire & Wire Products, 300 Main St., Stamford, Conn.



FINE WIRE HIGH SPEED
WIRE DRAWING SPOOLS



James Day (Machinery) Ltd.,
90 Regent Street
London W.I, England

MOSSBERG **PRESSED STEEL** CORP.

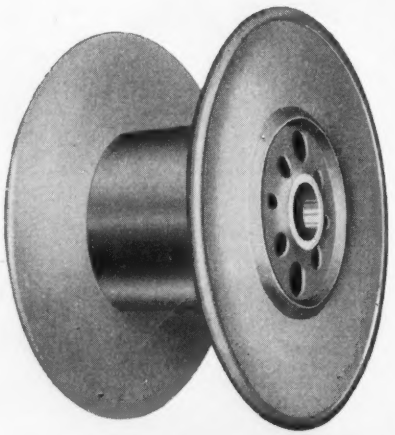
A complete line of HEAVY DUTY PRECISION SPOOLS and REELS especially designed for high speed wire drawing and annealing.

The degree of efficiency obtained by the HIGH SPEED WIRE DRAWING MACHINE is largely dependent upon the accuracy and durability of the take-up spool.

The use of our PRECISION SPOOLS will increase your machine efficiency and eliminate your spool difficulties.

Complete range of sizes.

MOSSBERG PRESSED STEEL CORP.
18 West Street,
ATTLEBORO, MASSACHUSETTS, U. S. A.



COMBINATION
500 lb. CAPACITY WIRE DRAWING—
ANNEALING — STRANDING — REEL.

NETTING, patented April 12, 1949 by James William Allan, Germiston, Transvaal, Union of South Africa.

The machine includes upper and lower oppositely vertically-reciprocating heddles, each of the heddles carrying eyed members, projecting toward each other, through which the warp wire passes and these move away from each other as the heddles move apart sufficiently to allow the warp wire in the eyes to be moved laterally.

★ ★ ★

NO. 2,467,164, ACID INHIBITORS, patented April 12, 1949 by Harold R. Slagh, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware.

In this patent, including a process for reducing the corrosive action of an aqueous non-oxidizing mineral acid solution on a ferrous metal, there is incorporated with the aqueous non-oxidizing mineral acid solution a liquid product selected from the class consisting of liquid sulfurized hydrocarbons formed by a direct reaction of sulfur with olefinic hydrocarbons having at least six carbon atoms in the molecule, which sulphurized hydrocarbons contain between about 15 and about 35 per cent by weight of chemically combined sulphur, and liquid products resulting from incomplete oxidation of this sulphurized hydrocarbons, which incompletely oxidized liquid products contain between about 3 and about 10 per cent by weight of chemically combined oxygen.

★ ★ ★

NO. 2,467,411, WIRE BASKET HAVING EXTENDED WIRE REINFORCEMENTS BENT TO FORM SLIDING CARD HOLDERS, patented April 19, 1949 by Warren M. Tingdale, New York, N. Y., assignor to National Transitads, Inc.

Except for the closure, this basket is constructed of heavy wire.

★ ★ ★

NO. 2,467,897, CONDENSER WINDER, patented April 19, 1949 by Thomas T. Logie, Bridgeport, and Joseph J. Galla, Fairfield, Conn., assignors, by mesne assignments, to Sprague Electric Company, North Adams, Mass., a corporation of Massachusetts.

In this machine, there is provided the usual arbor and an anvil providing paths of unequal lengths for the movement of laminated structures to the arbor, means to turn the arbor to wind the structures thereon one within the other, and a cutter for cutting the structures at spaced edges of the anvil whereby the cut end of one structure extends beyond the cut end of the other structure.

★ ★ ★

NO. 2,467,997, VACUUM CLEANER SUPPORT, patented April 19, 1949 by James W. Sheker, Fort Dodge, Iowa.

The support is formed of wire bent and twisted to shape.

★ ★ ★

NO. 2,468,091, ELECTRIC CABLE, patented April 26, 1949 by Bruce H. Maddock, Fanwood, N. J., assignor to Federal Telephone and Radio Corporation, New York, N. Y., a corporation of Delaware.

About the central wire conductor is a dielectric comprising a cord of low loss insulating material wound therearound in the form of an open helix of relatively long pitch, and a tubular member of low loss insulating material surrounding the conductor and the cord wound therearound but retained in spaced relationship thereto by longitudinally extending ribs, formed integrally with and extending radially inwardly from the interior wall of the tubular member, these ribs tapering inwardly and pressing against the helically wound cord but not against the central conductor.

★ ★ ★

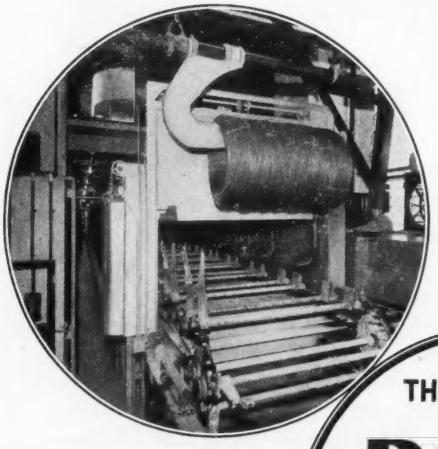
NO. 2,468,165, RESIN COVERED WIRE OR CABLE AND METHOD OF MAKING, patented April 26, 1949 by Joseph E. Brister, Summit, and Charles J. Burch, Plainfield, N. J., assignors to Bakelite Corporation, a corporation of New Jersey.

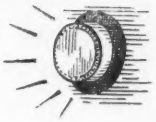
Surrounding the wire cable is an elastic sheath tensioned at a right angle to its length and comprising a tape of a composition comprising a polyvinyl resin and having the property of progressively losing its elasticity upon being heated and of recovering elasticity upon cooling and of welding to a similar composition under heat and pressure, this tape being laid longitudinally along the cable and having a longitudinal welded seam, the sheath firmly gripping the cable, the portion of the sheath at the welded seam having an elasticity different from the elasticity of other portions of the sheath.

★ ★ ★

WIRE AND ROD BAKING IS NOW

Completely Automatic





Push Button Control operates the entire process even to raising and lowering oven doors without manual handling.

From the sizable savings in time and labor along with doubled plant capacity which they provide, the remarkable ROSS Wire and Rod Bakers rapidly offset their entire cost as proven by their performance records in prominent plants.

THE MODERN

ROSS

STRAIGHT LINE

Baker

Consult us on the possibilities for your plant. No obligation.

ROSS SYSTEMS

J. O. ROSS ENGINEERING CORPORATION

MANUFACTURERS OF AIR PROCESSING SYSTEMS

350 MADISON AVENUE NEW YORK 17, N. Y.

201 N. Wells Street, CHICAGO-6 • 79 Milk Street, BOSTON-9 • 9225 Grand River Avenue, DETROIT-4 • 600 St. Paul Avenue, LOS ANGELES-14

ROSS ENGINEERING OF CANADA, LIMITED, MONTREAL, CANADA • CARRIER-ROSS ENGINEERING COMPANY, LIMITED, LONDON, ENGLAND

Macwhyte Issues Booklet on Preformed Wire Rope

A NEW folder has just been released by **Macwhyte Company** giving questions and answers on PREformed Wire Rope, stating questions normally asked about this product and giving the answers.

★ ★ ★

COPIES are available by writing to Macwhyte Company, or any of their distributors.

★ ★ ★

New Catalog is Complete Guide to Electronic Counters and Timers

THE new 4-page condensed catalog issued by the **Potter Instrument Company** is a brief guide to the company's complete line of High Speed Electronic Counters, Scalers, Counter Cronographs and special electronic frequency measuring and computing equipment.

★ ★ ★

IN addition to the description of the available standard counters, a discussion of the electronic counting principle, methods of count detection and typical applications is included.

★ ★ ★

COPIES may be obtained by writing to the Potter Instrument Company, Inc., 136-56 Roosevelt Ave., Flushing, N. Y.

★ ★ ★

Bar Rolling Mills Distributed Over Twenty-two States

U.S. rolling-mill capacity for steel bars is spread over 22 states, according to the **American Iron and Steel Institute,** which is a wider distribution than any other finished steel product. Wire drawing ranks second in distribution being carried on in 21 states.

★ ★ ★

THE same report, an annual study of steel plant distribution, shows that Pennsylvania, Illinois and Alabama rank first, second and third in capacity for nail and staple production, with Alabama ranking fourth in plain wire and reinforcing bar, and fifth in wire rod production.

★ ★ ★

CALIFORNIA holds the first place in reinforcing bars, sixth place in merchant bars and wire rod and seventh in nails, staples and some other forms of steel products.

★ ★ ★

ILLINOIS is in first place for plain wire and second for reinforcing bars, wire rods, nails and staples.

★ ★ ★

IT is interesting to note how widely our steel facilities are spread out to serve our nation's consumers.

★ ★ ★

For Improved Drawing and Longer Die Life

Copper-coat **WIRE, ROD and TUBING** *with*

Cuprodine®

"Cuprodine", in a simple chemical process without current, deposits an adherent layer of copper on both mild and stainless steels. This layer acts as an effective lubricant—reduces wear and scratching of dies; prolongs die life; minimizes scratching on wire, rod and tubing; and increases the number of draws per die.

CHEMICALS ACP PROCESSES

RUST PROOFING AND PAINT BONDING
Granodine *
Duridine *
Alodine *
Lithoform *
Thermoil-Granodine *

RUST REMOVING AND PREVENTING
Deoxidine *
Peroline *

PICKLING ACID INHIBITORS
Rodine * ®

"Cuprotek"® passivates Cuprodized and other cuprous surfaces, and acts as a paint bond, or a good temporary preventive of corrosion.

Write or call Ambler 0486, for further information on both "Cuprodine" and "Cuprotek".

Pioneering Research and Development Since 1914

AMERICAN CHEMICAL PAINT COMPANY

AMBLER, PA.

Manufacturers of Metallurgical, Agricultural and Pharmaceutical Chemicals

When you write an ADVERTISER for prices and information, PLEASE MENTION the fact that you saw his ad in WIRE AND WIRE PRODUCTS. It identifies your inquiry and expedites service.

Static vs Dynamic Test Methods

(*Continued from page 500*)

tainable if the wire could be made to assume the arc curvature and rotated. Thus, the inner and outer curvatures of the arc would be subjected to alternate tensional and compressive stress, and failure would then obtain at the weakest spot within the given length.

★ ★ ★

THE evolution in the development of wire fatigue machines is best illustrated by the following figures:

Figure 1

SHOWING the conventional types of machined test specimens and the only type (VI) suitable for testing wire materials. (from A.S.-T.M.).

★ ★ ★

Figure 2

THE Woernle machine was developed in Germany about 1931 The arc curvature of the wire test specimen was realized by means of a grooved circular guide, but ultimate failure was more or less controlled by the frictional effects.

★ ★ ★

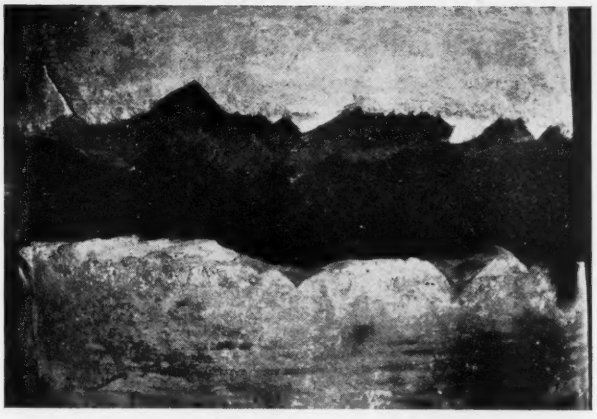


Figure 10. * * * * * * * * *

Figure 3

THE Deforest-Hopkins machine was developed in 1932. The design is somewhat similar to the German machine with an oil-can added to eliminate friction on the specimen.

★ ★ ★

Figure 4

THE Shelton machine was developed at the National Bureau of Standards in 1931. This design was of far-reaching importance since the arc curvature was realized without resort to the circular grooved guide. Unfortunately, many breaks occurred at the bearings and the machine had to be lengthened. This changed the curve to that of a modified catenary with the fatigue break confined to the center (or near center) of length.

★ ★ ★

THE 1949 ANNUAL CONVENTION OF THE WIRE ASSOCIATION

will be held in **CHICAGO, ILL.,** *at the*

LA SALLE HOTEL

October 17th through 20th

Make Your Reservations Now — Space Limited

to **RICHARD E. BROWN**
Executive Secretary

THE WIRE ASSOCIATION

300 MAIN STREET **STAMFORD, CONN.**

See Pages 509 through 512 for details concerning sessions, speakers and plant inspection.

Figure 5

THE Haigh-Robertson machine (British) was developed about 1933. The specimen is a rotating distorted strut, obtained by end thrust. Of necessity all breaks are confined to the center of length. It is believed that the design was suggested by the experiences of the Shelton machine in bearing breaks.

★ ★ ★

Figure 6

THE Rotating-Wire Arc Machine (Kenyon). The specimen is bent to a curve by means of two inclined bearing guides and is rotated from one end from a motor. When rotated, the wire slides in the free bearing and **automatically** assumes the curvature of the circular arc.

★ ★ ★

Figure 7

SHOWING the Arc machine testing two specimens at a speed of 5000 RPM. The solution is distilled water of pH = 6.0. The purpose of the distilled water (or of any weak solution) is to determine the corrosion-fatigue value, and not, necessarily, to dampen out vibration.

★ ★ ★

STRAIGHT wire specimens will run in air without appreciable vibration. Bearing failures are seldom encountered.

★ ★ ★

Figure 8

SHOWING the condition of steel wire (cable grade) after testing in distilled water by the Arc method.

Top—Broken unplated wire showed numerous fatigue cracks but still retained some ductility. This is evidenced by the fact that it could be bent to a large coil.

Center—Bronze plated wire. Here the fatigue cracks were so numerous (often 0.02″ apart) that the wire could be broken into one-inch lengths with the fingers.

Bottom—After fatigue failure, zinc plated wire could be bent to a helix around a ¼″ diameter rod.

★ ★ ★

Figure 9

SHOWING a bronze protected 16″ diameter ocean propeller shaft which failed, due to corrosion-fatigue, after 3-¾ years in service. The phenomenon of failure is precisely that of the bronze plated wire, shown in Figure 8.

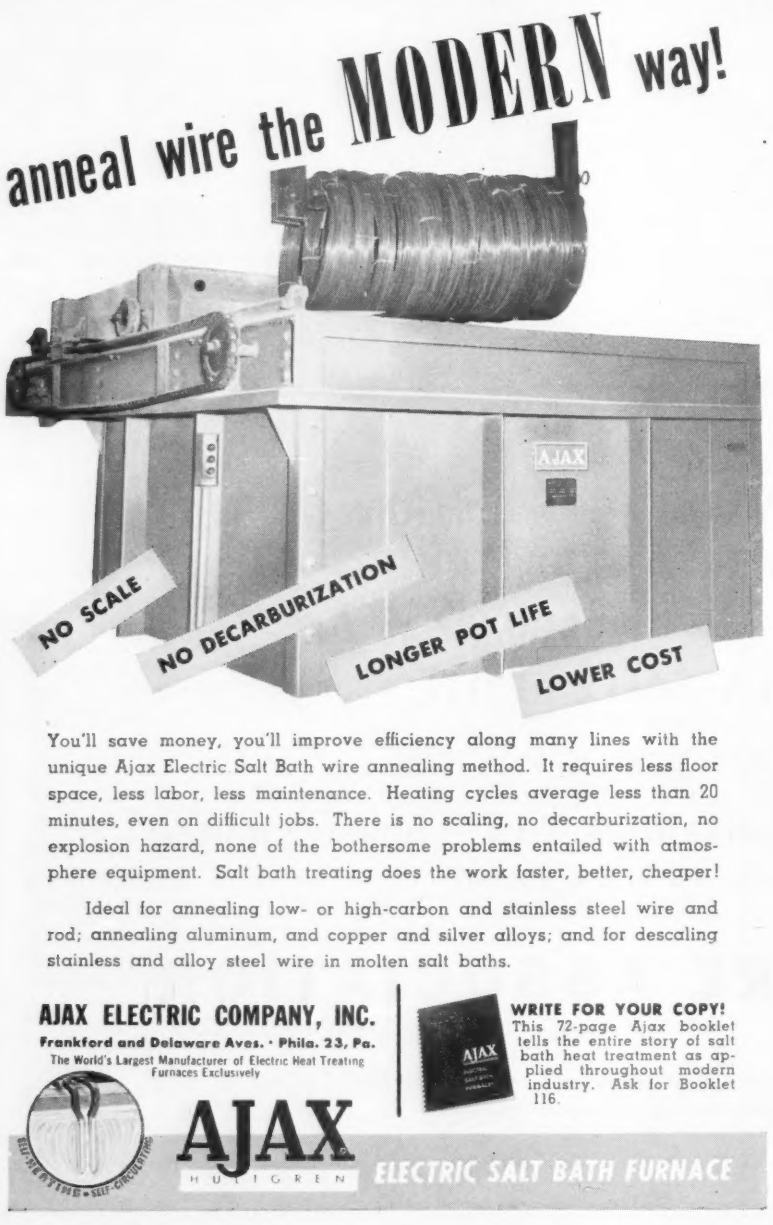
★ ★ ★

THE nature of these failures (Figs 8 and 9) are essentially galvanic. Copper is **noble** to steel and zing is **basic.** Under variable stress conditions in corrosive environment, the exposed steel attempts to **protect** the bronze. Consequently, a corrosion pit and ultimate fatigue developes at every pin-hole point of imperfection.

★ ★ ★

Summation

IT will be demonstrated in a following paper that the only true service test of a wire material is the corrosion fatigue test. This is evidenced by the fact that the usual service conditions, under which wire cable and like constructions must perform, is of corrosive nature; in sensitivity and more or less similar to distilled water.



You'll save money, you'll improve efficiency along many lines with the unique Ajax Electric Salt Bath wire annealing method. It requires less floor space, less labor, less maintenance. Heating cycles average less than 20 minutes, even on difficult jobs. There is no scaling, no decarburization, no explosion hazard, none of the bothersome problems entailed with atmosphere equipment. Salt bath treating does the work faster, better, cheaper!

Ideal for annealing low- or high-carbon and stainless steel wire and rod; annealing aluminum, and copper and silver alloys; and for descaling stainless and alloy steel wire in molten salt baths.

AJAX ELECTRIC COMPANY, INC.
Frankford and Delaware Aves. · Phila. 23, Pa.
The World's Largest Manufacturer of Electric Heat Treating Furnaces Exclusively

WRITE FOR YOUR COPY!
This 72-page Ajax booklet tells the entire story of salt bath heat treatment as applied throughout modern industry. Ask for Booklet 116.

AJAX
HUTTGREN
ELECTRIC SALT BATH FURNACE

Bibliography

Figure 1—"The Effect of Type of Testing Machine on Fatigue Test Results", Committee Report *Proceedings*, Am. Soc. Testing Mats., Vol 41, P-137 (1941).

Figure 3—DeForest and Hopkins, "The Testing of Rope Wire and Wire Rope." *Proceedings*, Am. Soc. Testing Mats., Vol 32, p-398 (1932).

Figure 4—S. M. Shelton, "Fatigue Testing of Wire". *Proceedings*, Am. Soc. Testing Mats., Vol 31, p-204 (1931).

Figure 6—J. N. Kenyon,"Rotating-Wire Arc Fatigue Machine for Small Diameter Wire." *Proceedings*, Am. Soc. Testing Mats. Vol 35, p-156 (1935).

Figure 7—"A Corrosion-Fatigue Test Method to Determine the Protective Qualities of Metallic Platings." *Proceedings*, Am. Soc. Testing Mats., Vol 40, p-705 (1940).

Figure 8—J. N. Kenyon, "Service Behavior of Plated Steel Wire as Indicated by the Corrosion-Fatigue Test" Wire and Wire Products, August (1943).

★ ★ ★

The Manufacture of Coil Springs Under Completely Mechanized Conditions

(*Continued from page 506*)

them for the shot peening machines.

★ ★ ★

THE peening machines clean and cold work the springs until their surfaces are smooth, automatically ejects them onto a conveyor. The conveyor carries the units to the black paint dip and then passes them through a drying oven. The coil springs are quickly dried in the ovens 450 degrees fahrenheit temperature and are then conveyed to the operation's final stage—testing.

★ ★ ★

IN testing, the coil springs are first put through a "bulldozing" operation which compresses the spring to solid height. After this the springs are subjected to a weight of 1,875 pounds which compresses the spring to the normal load height of 9.22 inches. This normal load is an exact duplication of the car weight the spring will have to undergo after installation in the new 1949 Ford.

★ ★ ★

THEN the coil springs are palletized and shipped to branch assembly plants at Norfolk, Va., Edgewater, N. J., Buffalo, N. Y., Sommerville, Mass., and Chester, Pa.

★ ★ ★

New Paper Clip and Staple Line Introduced

PITTSBURGH CUT WIRE COMPANY, makers of the well-known Arma Gem Paper Clips and other wire products, has introduced their new line of Arma brand staples. These staples will fit all standard make stapling machines, and will be packaged 5,000 to the box. They are available to jobbers in boxes with dealer imprint.

★ ★ ★

Bulletin Describes Burners for Immersion Heating

SURFACE COMBUSTION CORPORATION has just issued an attractive two-color bulletin showing application of 'Surface' burners to typical immersion heating installations.

★ ★ ★

COMPLETE with photographs showing operation of units, the four-page folder discusses various processes to which these versatile burners are adaptable. Both suc-

NEBUTTCO

WIRE MEASURING MACHINES

FOR QUICK, ACCURATE MEASUREMENT OF WIRES OR CABLES . . .

Wires or cables passing through this machine are accurately measured and their lengths recorded on an easily read counter. Lengths up to 100,000 feet . . . nearly 19 miles . . . can be registered. Counter can be easily set back to zero at the start of a run. Machine is also available with counter mounted on right side. It can also be supplied with electric predetermined counter if desired.

Heavy cast iron standard, optionally supplied, provides firm support for machine, may be easily moved about on its rollers and adjusted to proper height by the rack and pinion. Machine illustrated is made in two sizes — No. 1 for measuring wires to 5/8" diameter and No. 2 for wires to 1½". We also manufacture a small bench type machine for measuring any flexible material not over 5/16" diameter.

For complete specifications ask for Circular No. 1

NEW ENGLAND BUTT COMPANY

Established 1842

304 PEARL STREET • PROVIDENCE 7, R. I., U. S. A.

JAMES DAY, MACHINERY LTD., 90 REGENT ST., LONDON, W-1., ENGLAND

tion and atmospheric type burners are described. Applications to such jobs as interrupted quenching, rust-proofing processes, cleaning diesel motor blocks, and cleaning scale from cast metal parts, are presented. Useful data tables are included showing the heat requirements for water in open tanks, both dip and spray types.

★ ★ ★

A COPY of this brochure may be secured by writing to Surface Combustion Corporation, Toledo 1, Ohio, requesting bulletin SC-142.

★ ★ ★

British Develop Process for Wire Rope Lubrication

AN important development for all industries using wire ropes is the invention by a Glasgow firm of a pressure lubricating system that eliminates existing methods of hand oiling and is claimed to achieve—an economy of two-thirds the oil formerly used; a major economy in the labor required for the work and a considerable increase in the life of the rope. Firm concerned is the **Cathcart Engineering Co., Ltd.**, of Shettleston, Glasgow, formed in 1945 by William Bird, an American, and Alexander M'Pherson, who had met during military service.

★ ★ ★

THE unit is some 12″ long, 10″ wide and 6″ diameter, and weighs approximately 22 lbs. An upper tank holds the lubricating liquid which is fed into the unit by gravity. The spiral movement of the rope helix passing through the chamber spins the rotor that actuates the pump, forcing oil into the chamber, which is under constant pressure. The lubricating liquid is forced into the very core of the rope where the bulk of deterioration normally originates. The rope is cleaned previous to oiling by a system of dies. These units have been in use for the past three years, although information has been withheld until recent months. Gauge checks on ropes used in the first year showed only a negligible loss while second and third year gauge tests showed absolutely no loss. The National Coal Board, one of their customers, renews normally ropes at given periods for safety purposes and will undertake exhaustive research work on sections of ropes treated over the past two years to ascertain what effect the new system has had on these ropes.

★ ★ ★

NORMAL hand oiling consumption is 2 to 3 gallons per 2,000 ft. of rope; only 1 gallon is used with the pressure lubricator. Mass production of smaller units is intended in the reasonably near future, handling ropes of up to 1¾″ diameter. While the unit has been largely confined so far to home use and mainly to Coal Board purposes tremendous export prospects are visualized and a major economy in every industry using wire ropes is foreseen.

★ ★ ★

New Holidays with Pay Asked by Unions

LABOR unions in the Cleveland area are suggesting that in their new contracts with manufacturers, the employees should be allowed additional paid holidays, including one on the Roosevelt

If you knew **Moly'**...as we know **Moly'**!

WHETHER you need Molybdenum for conventional use or for an unusual application, we can supply you with Elmet Molybdenum in sheet, rod or wire form.

F'rinstance: A manufacturer recently required some Molybdenum rod that could be machined and formed into unusual shapes. We introduced him to ELMET MOLY'—and solved his problem. It conformed perfectly to the unusual requirements of the job and was delivered to his complete satisfaction.

For Molybdenum for any application, you can rely on ELMET MOLY'. We've supplied it in sheet, rod or wire form for such varied uses as electronic tubes, windings for high temperature furnaces, precision laboratory apparatus, metal vaporization equipment and firing boats.

* * *

North American Philips also supplies Tungsten and other metals in fine wire form . . . bare, coated or plated with silver, gold, copper or enamel.

So, when you have a problem on Fine Wire, Tungsten, or Molybdenum, why not call on Fine Wire Headquarters. Phone, wire, or write to North American Philips, makers of NORELCO Fine Wires and ELMET Tungsten and Molybdenum products.

NORTH AMERICAN PHILIPS COMPANY, INC.

Dept. FE-6, 100 East 42nd Street, New York 17, N. Y.

(Franklin's, that is) birthday anniversary, it was reported by The Associated Industries of Cleveland.

★ ★ ★

GENERALLY, Cleveland companies grant their employees six holidays: New Year's, Memorial Day, July 4, Labor Day, Thanksgiving, and Christmas. And those that don't will feel more than a little pressure from the unions, The Associated Industries said. Also prominently mentioned, in addition to the Roosevelt anniversary (January 30), are Washington's and Lincoln's Birthdays, election day, and Good Friday.

★ ★ ★

THERE are no "national" holidays in the United States. Each state has jurisdiction over the holidays to be observed, and these are designated either by legislative enactment or executive proclamation. The President and the Congress have designated for the District of Columbia and government employees seven holidays: New Year's, Washington's Birthday, Memorial Day, July 4, Labor Day, Armistice Day, Thanksgiving, and Christmas.

★ ★ ★

Diamond Powder Folder

ENGIS EQUIPMENT COMPANY 431 So. Dearborn Street, Chicago 5, Ill., has issued two bulletins, one describing Hyprez diamond compounds and their applications and the other, entitled, "Techniques for Lapping and Polishing" providing information on the proper use of Hyprez compounds. A list of the grades in which Hyprez is furnished is included, together with recommended uses for each.

★ ★ ★

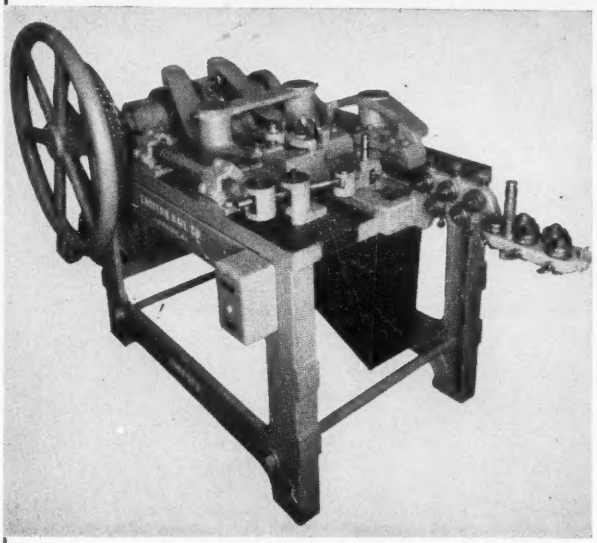
THE Company also has for distribution a folder describing a new Swiss microscope that is made particularly for the examination of die contours and surfaces.

★ ★ ★

COPIES of any of these may be secured by writing the Engis Equipment Company.

★ ★ ★

PROMPT DELIVERIES ON
"ENCO"
WIRE NAIL MACHINES



Easy To Set Up And Operate.

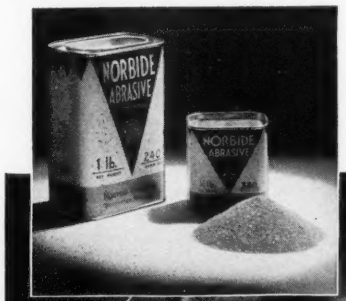
Furnished belt drive or with motor including V belts, starter, etc.

No. 2 size will cut nails up to 3" long No. 9 gauge and the No. 1 size up to 1¾" long No. 13 gauge.

Write for prices, stating size and number of machines wanted.

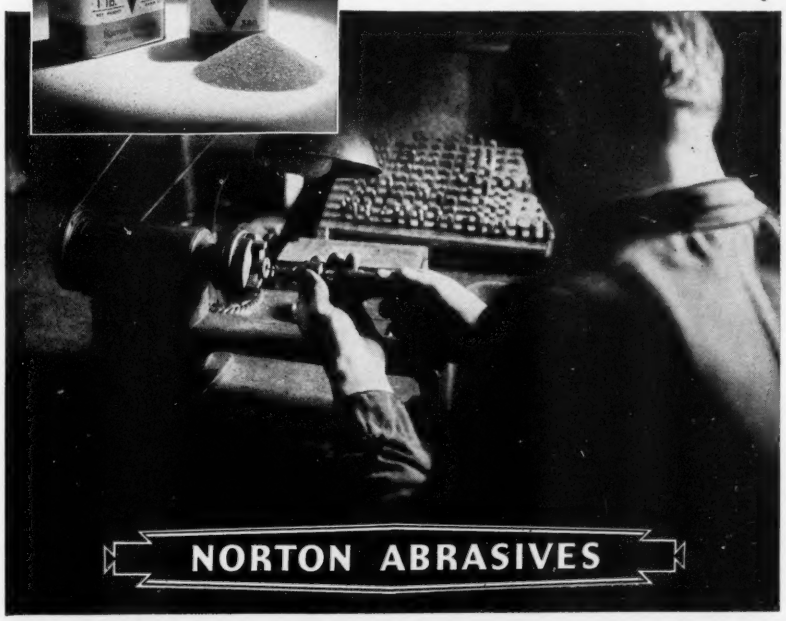
EASTERN NAIL COMPANY
55 ALEPPO STREET • PROVIDENCE 9, R. I.

NORBIDE Abrasive: Effective, Economical



This abrasive—second only to the diamond in hardness and 150 times less expensive—does an efficient job of cutting and semi-finishing cemented carbide wire drawing dies.

NORTON CO. — Worcester 6, Mass.



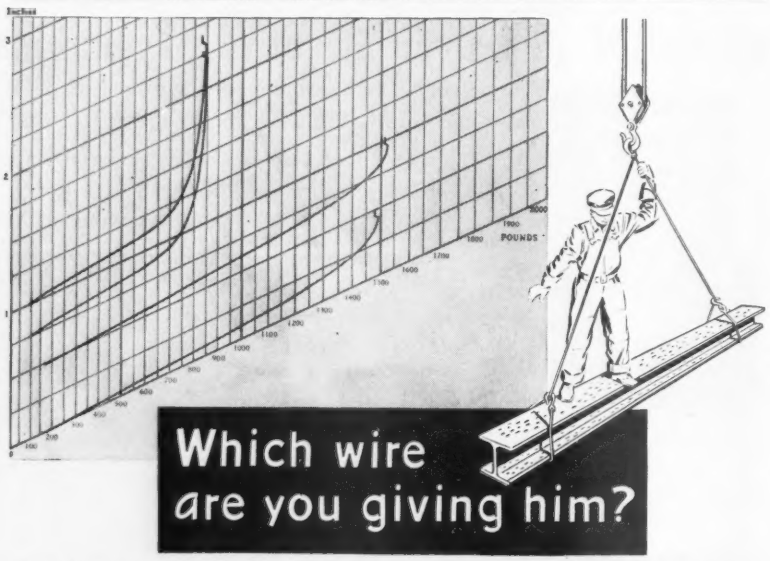
Porter Tools have harder cutterheads that *Cut* harder stock easier and last longer.

Have you seen our triplets yet?

Three styles of HandKliP one-hand tools with plenty of cutting uses.

SEND FOR CIRCULARS

PORTER HANDKLIP & H. K. PORTER, INC. HKP Somerville 43, Mass. CUTTERS POWER LINE



The above graphic chart allows the comparison of the effect of various manufacturing processes on wires to indicate the change in physical characteristics. Such charts as this can be produced on a *Scott Tester—Model Q—with capacity up to 2000 lbs. tensile. Let Scott "picturized" testing speed production and safeguard quality in YOUR plant.

*** Registered Trademark**

SCOTT TESTERS, INC. **55 Blackstone Street Providence, R. I.**

Scott Testers — Standard of the World

Maryland Wire Mill Destroyed by Fire

THE many friends of **L. C. (Red) Crewe,** President of **Maryland Fine & Specialty Wire Co.,** Cockeysville, Md., will learn with regret that the entire plant burned to the ground on May 5th. There was no loss of life or injury to personnel. All records, however, and much special equipment that will be difficult to duplicate were destroyed. Mr. Crewe is planning to rebuild immediately. The business had a substantial backlog of orders on hand and no stone will be left unturned to get into operation at the earliest possible date.

★ ★ ★

THE building was of concrete and cinder block, 160′x80′ and considered fire-proof; Mr. Crewe reports that the fire was apparently caused by the backfiring of a furnace igniting a lacquering pot and spreading to other equipment. Everyone wishes Mr. Crewe and his associates all success in the speedy rehabilitation of the enterprise.

★ ★ ★

How to Secure a First Class Copper Coating without Scaling

A NON-ELECTROLYTIC coppering process for steel wire or rods called "The FLUIDOX PROCESS" has been given extensive use by many regular customers in the United States and Canada over a period of years, who report considerable satisfaction from its use.

★ ★ ★

THE process is said is so simple that every wire mill is able to use it, because no alteration in their equipment or special handling is necessary. The best adherence of the copper coating, no scaling, black spots or uncovered wire will be assured.

★ ★ ★

COPPER coating with FLUIDOX also provides an excellent base for tinning, galvanizing, enameling or whatever metallizing or rubber coating, because most of the coating-metals adhere much better to

copper than to steel. Full information in FLUIDOX may be obtained from the **TECHEMA COMPANY**, 1200 Niagara St., Buffalo 13, N. Y.

★ ★ ★

William T. Mossman

WILLIAM T. MOSSMAN, for many years in charge of publicity and press relations for **Jones and Laughlin Steel Corporation** before his retirement in September 1947, died at the Presbyterian Hospital here recently after an illness of several months. He was 76-years old on May 3rd.

★ ★ ★

A NATIVE Pennsylvanian, Mr. Mossman was graduated from Allegheny College in 1895, having worked his way through college teaching art and surveying in the Summer. He came to Pittsburgh in 1896 and started his career as a reporter and artist on the old **Pittsburgh Leader,** then the leading Pittsburgh evening paper. From 1900 to 1902, he was editor of the weekly **Bulletin-Index.** In 1905 he was manager of the Pittsburgh Symphony Orchestra when Victor Herbert was a conductor.

★ ★ ★

HE joined Jones and Laughlin Steel Corporation in 1907. For the next 40 years, his activities were more varied than apparent, but he engaged principally in dealing with the press and guiding J & L's public relations. He was always ready to assist young reporters covering steel activities and won from many of them an abiding respect and friendship.

★ ★ ★

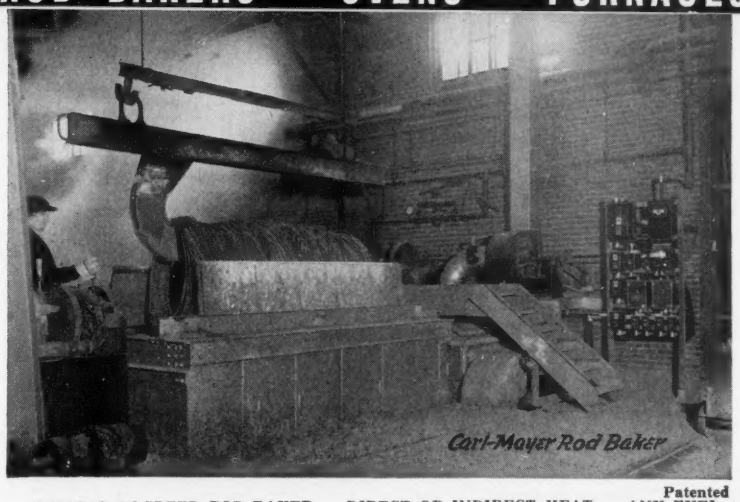
HE was one of the champions of downriver shipment of finished steel by Jones and Laughlin.

★ ★ ★

A SON Robert, is advertising manager of Jones and Laughlin. Among his other survivors is a nephew, Alfred Mossman Landon, Republican Presidential candidate in 1936.

★ ★ ★

MORE PRODUCTION
with CARL-MAYER HI-SPEED
ROD BAKERS - OVENS - FURNACES



Patented
TYPICAL HI-SPEED ROD BAKER — DIRECT OR INDIRECT HEAT — ANY FUEL
WRITE for BULLETIN No. 241

Growing interest in our type of equipment is evidenced by Carl-Mayer installations for such plants as:—

American Steel & Wire Co.
Atlantic Wire Co.
Atlas Steel Co.
Atlas Tack Corp.
California Wire Cloth Corp.
Eaton Mfg. Co.
Frost Steel & Wire Co. Ltd.
Hollup Corp.
Johnson & Nephew Ltd.
Jones & Laughlin Steel Corp.
Pittsburgh Tool Steel Wire Co.
Republic Steel Corp.
Steel Co. of Canada
Wickwire Spencer Steel Div.
Page Steel & Wire Co.

THE CARL-MAYER CORPORATION
3030 EUCLID AVENUE
CLEVELAND, OHIO

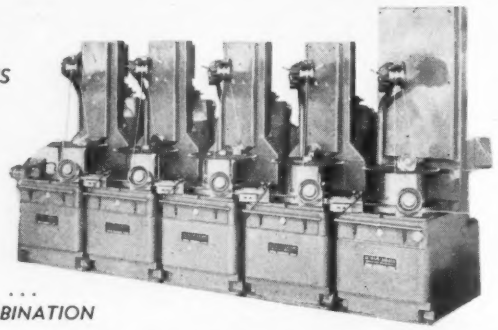
JOHNSON
STEEL AND WIRE COMPANY, INC.
WORCESTER 1, MASS.
NEW YORK PHILADELPHIA CHICAGO CLEVELAND DETROIT
AKRON TULSA ATLANTA HOUSTON
LOS ANGELES TORONTO

AETNA-STANDARD WIRE DRAWING UNIT

- DESIGNED FOR COMPLETE VERSATILITY
- BUILT FOR SAFE, EFFICIENT PRODUCTION
- SINGLE OR MULTI-DRAFT OPERATION
- INTERCHANGEABLE UNITS AND PARTS
- AUTO-RHEOSTATIC SYNCHRONIZATION
- WATER COOLED BLOCKS AND DIES

FERROUS OR NON-FERROUS

WET OR DRY LUBRICANTS



SINGLE UNIT ... OR ANY COMBINATION

THE AETNA-STANDARD ENGINEERING CO.
YOUNGSTOWN, OHIO

ASSOCIATED COMPANIES: HEAD, WRIGHTSON & COMPANY, LTD., THORNABY-ON-TEES, ENGLAND
AETNA-STANDARD ENGINEERING COMPANY, LTD. . . . TORONTO, ONTARIO, CANADA

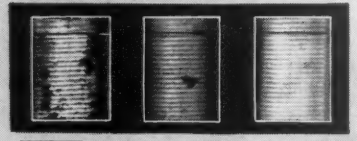
REVOLUTIONARY New Method of Rust Control

Outperforms other more complex, more costly "preventives". Answers problems never before solved. CLEAN, SIMPLE TO USE!

Eliminates Slushing in Oil – It's . . .

Angier VPI® Wrap
*Vapor Phase Inhibitor developed by SHELL

PROOF: Identical steel parts exposed 9 months to industrial-marine atmosphere. These photos are unretouched.



Without VPI | Without VPI, but Slushed in Oil. | With VPI

ANGIER creped, waterproofed, reinforced papers for industrial, building and farm use.

MORE than a non-corrosive paper — a revolutionary packaging method of COMPLETE rust control. Get the facts now!

Angier CORPORATION
FRAMINGHAM 3, MASS.
Industrial Packaging Engineers Since 1895

Gentlemen: Please send FREE 12 page booklet, "Complete Rust Control with Angier VPI Wrap".

Name.....
Address.....
City & State.....

Just Off the Press!

Jessop Steel Issues New Catalog

LEADING brands of Jessop stainless and heat resisting steels, tool and die steels, and cast-to-shape steels are described in a new booklet, Jessop Specialty Steels, just published by **Jessop Steel Company,** Washington, Pa. Typical analysis and applications are included for each brand.

★ ★ ★

New Wage Hour Bill Analyzed

A COMPLETE analysis of the proposed new Federal Wage-Hour Bill, now being considered by the House Labor Committee, has been submitted to members of the Labor Relations Institute, New York.

★ ★ ★

THE Institute report compares the present law and the proposed law and points out that, "it appears that there really are going to be drastic changes in the Wage and Hour Law now on the books."

★ ★ ★

THE comparison, prepared by the Institute's Research Division, shows where the new bill differs importantly from the present law. It goes on to point out that a similar bill introduced in the Senate awaits action by its Labor Committee which presently is fully occupied with proposed legislation to supplant the Taft-Hartley Law.

★ ★ ★

LABOR bills in the "hearing" stage seldom bear close resemblance to the end product that finally become law, notes the LRI report. However, informed opinion at this time is that most administration sponsored changes will be enacted into a new 1949 Fair Labor Standards Act.

★ ★ ★

THE Institute comparison discusses the following:

(1) Coverage
(2) Exemptions
(3) Minimum Wage
(4) Overtime
(5) Child Labor
(6) Administration

★ ★ ★

FOR a free copy of the Institute's comparative analysis, write to the LABOR RELATIONS INSTITUTE, 1776 Broadway, New York 19, N. Y.

★ ★ ★

SKF Sends Monthly Inventory List to Leading Customers

A UNIQUE method of keeping its principal customers advised of the stock availability of ball and roller bearings in which they are interested has been introduced by **SKF Industries, Inc.,** to help manufacturers best meet their own productive requirements.

★ ★ ★

THE inventory-availability service each month calls to the attention of leading customers in each of the company's sales territories what bearings they use that are in stock or expected to be in stock within a 30- to 90-day period. The system has been in effect since November.

★ ★ ★

EACH personalized list is compiled from a master sheet showing customer preferences, and then checked against stock availability. While quantities are not stated, inasmuch as these fluctuate daily, the listings inform customers whether the particular bearings they require are in stock or can be obtained within the 90-day period.

★ ★ ★

AVAILABILITY lists are printed with heading in four different colors, used in sequence over a four-month cycle. Customers are asked, on receiving the new monthy list, to destroy the previous month's list.

★ ★ ★

Employers Capacity to Manage Threatened by New Labor Bill

EMPLOYERS capacity to manage may be considerably reduced if the Administration-sponsored Thomas-Lesinski Labor Relations Act Bill is passed in its proposed form, points out the Labor Relations Institute, New York.

★ ★ ★

EXTRUDERS

THAT OFFER MORE

WIRE COVERING CAPACITY

mpm

MPM offers six-zone control of electrically heated cylinders with nine-eleven or fifteen separate cooling zones for removal of frictional heat or for fast cooling. Higher temperatures—higher screw speeds—higher production—per machine.

FLEXIBILITY - Operating Economy

These MODERN machines are furnished electrically heated but can be heated or cooled by steam, oil, water, etc. Interchangeable heads and dies to produce covered wire, tubing, rods, strips, wide sheeting are also available along with conveyors, granulators, dryers, etc.

FAST DIE OR SCREEN CHANGES

Modern engineering and specialization has resulted in the installation of these machines with 18 of a possible 20 leading material suppliers during the past two years. More complete cooperation with foreign customers too has made MPM the largest exporters of Extruding equipment during the same period.

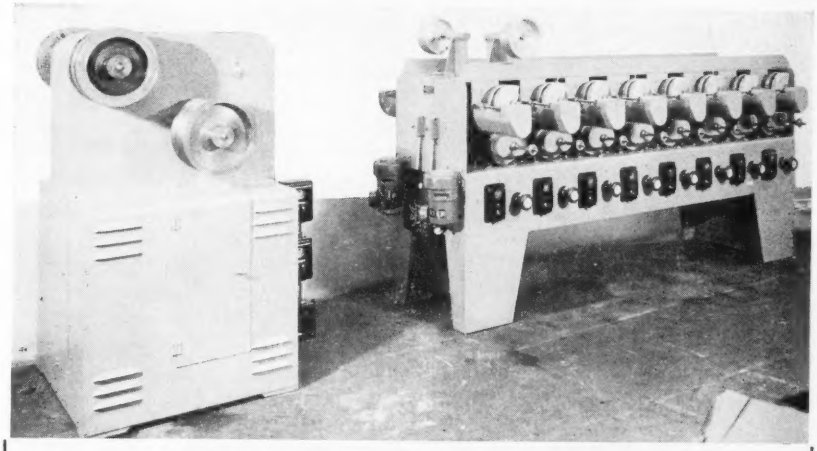
modern plastic machinery corp. mpm

GREATER *Flexibility* = MORE PROFITS!

SEND FOR BROCHURE

15 UNION ST., LODI, N. J.

CABLE ADDRESS MODPLASEX



16 WIRE TORQUE MOTOR PULL-OUT No. 966

Compact take-up and capstan unit for 16 lines of wire, each line having separate rheostatically controlled torque motor with gearhead.

Traverse motion individual for each wire and adjustable for width of reel and rate per turn. Divided capstans permit a different speed for each 4 wires.

Also available with modifications to suit individual operating requirements. State details of application.

Est. 1853 AIMCo INC. 1918

"American" AIM INSULATING MACHINERY COMPANY

517 West Huntingdon Street
Philadelphia 33, Pa., U.S.A.

STANNOUS SULPHATE

for IMPROVED LIQUOR FINISHING of STEEL WIRE!

Stannous Sulphate, used for either straw color or white liquor finishing, provides these outstanding advantages:

1. A superior, smoother coating
2. Positive control — making it possible to produce uniform coatings day in and day out
3. Easier to use — fewer operations involved
4. Economy — requires use of less copper sulphate, less acid
5. More Economy — reduces tin losses by eliminating high tin sludging.

Write for information on how to use Stannous Sulphate to best advantage in your liquor finishing.

METAL & THERMIT CORPORATION
120 Broadway • New York 5, N. Y.

BY proposing repeal of the Taft-Hartley Law and reenactment of the old Wagner Act with certain amendments, the bill would place employers under obligation to bargain with supervisors as they must now bargain with organized production workers.

★ ★ ★

EMPLOYERS are urged to set up immediately a supervisory training program. The objectives of this program should be:

(1) Define the functions of supervisors, setting them apart from the men they direct.
(2) Make them feel they are part of management.
(3) Train them to be leaders.
(4) Root out discontent among supervisors.
(5) Render them immune to enticements of union organizers.

★ ★ ★

THE Institute is currently conducting such a program for a number of industries, and states that it has found that greater effectiveness can be realized when such a program is **tailor-made** to fit the specific needs of each company and supervisors involved.

★ ★ ★

FULL details on this special type of supervisory training may be obtained by writing to the Labor Relations Institute, 1776 Broadway, New York 19, N. Y.

★ ★ ★

New Spoke Making Machine Developed in England

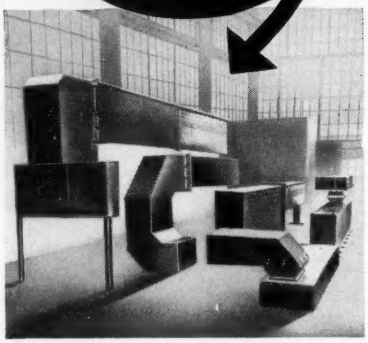
BEFORE the last World War, the founder of an old-established Engineering Company of Machine Tool Makers often reproached British Engineering for not manufacturing special purpose cycle spoke production machinery. That gentleman was the late **Daniel Smith,** M.I. Mech.E., of the Company bearing his name at Castle Iron Works, Wolverhampton, who was well known for his inventions in machinery for many trades.

★ ★ ★

HIS successors set out, at the end of hostilities, to investigate the cycle spoke making industry abroad, with a view to acquiring the most up-to-date knowledge of spoke production, and this done, commenced development.

★ ★ ★

Fume Duct Maintenance NO LONGER A PROBLEM HERE!



• One plant made this installation entirely from HAVEG—and then stopped worrying about damaging, corrosive fumes. HAVEG can give *you* the same freedom from corrosion problems, too. It is a different molded material that resists chemical action *through its entire mass.* Not just a lining or coating, it is not affected by surface gouges or abrasion. What's more, it is strong and lightweight. Resists shock. And it is remarkably easy to machine!

In tanks, blowers, agitators, valves, piping, pumps, towers—in a hundred and one applications—HAVEG can help you lengthen process equipment life, reduce maintenance costs. A trial order will convince you—send yours in today. Or, write for Bulletin F-5—it contains engineering and application information that will interest you.

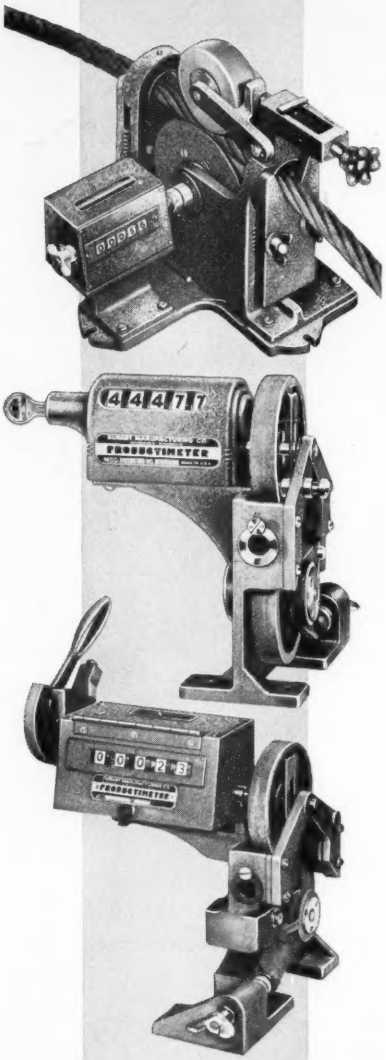
Available in complete range of sizes to meet every process equipment need!

HA-3-49

HAVEG CORPORATION
NEWARK 47, DELAWARE

CHICAGO 11 · CLEVELAND 14 · HARTFORD · HOUSTON 6 · DETROIT 11 · LOS ANGELES 13 · SEATTLE

PRODUCTIMETER
WIRE MEASURING MACHINES
Fast . . Accurate . . Dependable . . Legible



Productimeters measure all types of wire from .010 to 3½ inches in diameter . . . at speeds up to 5,000 feet per minute. They eliminate "guess-work". . . insure profitable operation in your plant.

Send for Catalog No. 40

DURANT MFG. CO.
1918 N. Buffum St. Milwaukee 1, Wis.
118 Orange St. Providence 3, R. I.
Representatives in Principal Cities

PRODUCTIMETERS
SINCE 1879 *Speedometers* OF INDUSTRY

TWO years later, and after hundreds of hours had been spent in designing and draughting, a completely new and improved machine has been created; this prototype has been made, tested and proved successful at a rate of production of over 80 spokes per minute continuously.

★ ★ ★

THIS new Universal Automatic Spoke Production Machine has, through its high operational efficiency in converting the coiled wire to finished spokes, virtually reduced production costs to the basic price per ton of the wire.

★ ★ ★

BRITISH and Overseas cycle manufacturers can now acquire these universal automatics to equip and balance the requirements of their factories. A number of these machines will be available from production monthly throughout the year.

★ ★ ★

THE obtainment of spokes, which has before been difficult, has attained a higher importance as the export sale of a bicycle cannot be effected without them.

★ ★ ★

THE Universal Automatic Cycle Spoke Production Machine is manufactured to produce spokes from 14 to 17 gauge wire, and is adjustable to make any length of spoke from 7½″ to 13″ long in rustless or stainless steel spoke wire. By the fitting of special accessories, the machine can produce shorter spokes from 5″ long.

★ ★ ★

THE operational sequence of production is briefly as follows:

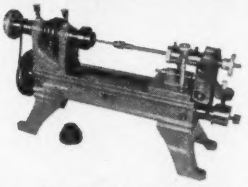
Operation 1. Straighten Wire.
Operation 2. Cut to rough length.
Operation 3. Trim to final length.
Operation 4. Cold head.
Operation 5. Crank bending head (Length of bend adjustable.)
Operation 6. Roll thread.

★ ★ ★

THE Prototype Machine is on permanent demonstration for all who are interested to view by appointment, at Messrs. Daniel Smith, Limited, Castle Iron Works, Peel Street, Wolverhampton, Eng.

★ ★ ★

NEW **ROOS**
DIE ROOM EQUIPMENT
SEMI-AUTOMATIC POLISHER



MODEL OT - PATENT REGISTERED AND APPLIED FOR

Note these outstanding features for greater accuracy in polishing dies and for prolonged machine life!
(a) Quick opening spindle
(b) Pressure adjustor
(c) New cam assembly
(d) New style leather belt

NEW STYLE TAILSTOCK
To Fit Other Model
ROOS Polisher Model OT

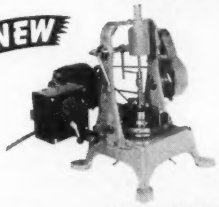
NEW

MODEL OT

You can quickly and easily replace the tailstock on your old Roos Semi-Automatic Polisher with the New Model OT-Tailstock. Quotation on this new Tailstock furnished on request.

ROOS
AUTOMATIC DIE SHAPING MACHINE

NEW

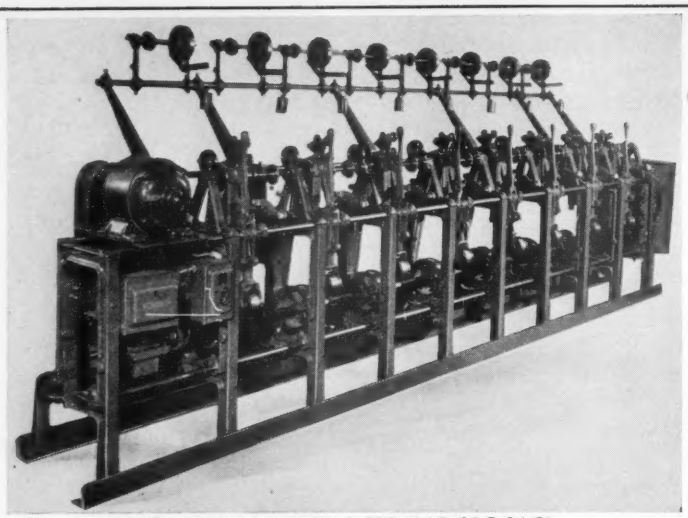


MODEL DS-3A

Offers you three improved features: a die rotating attachment; a time switch; and a reversing switch—which provide these advantages:
1. Die rotating attachment and time switch eliminate the formerly necessary constant attention by operator. Rotation of die is automatic, and machine shuts off automatically at end of time cycle.
2. Reversing switch permits rotation of the die in either direction.

Write today for full information!

ROOS TOOL
& MFG. COMPANY
17-19 Grove Street
Montclair, New Jersey



NO. 1900H MULTIPLE SPINDLE SPOOLER

Winds wire with maximum diameter of .080".
Accommodates spools up to 16" flange diameter.
Spool spindles can be started or stopped individually and traverse is adjustable for length over its entire range.
Other spoolers made to accommodate any size of wire and operating condition. Spoolers are also engineered to meet your special needs. Only finest workmanship and materials used.

On Spooling problems consult

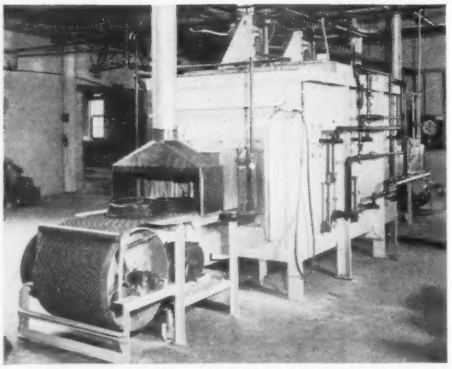
ROBERT J. EMORY COMPANY

31 EAST RUNYON STREET NEWARK 5, NEW JERSEY

ROCKWELL Belt Conveyor FURNACES

For Continuous, Uniform Annealing, Bright Annealing or Hardening Rod or Wire in Coils or on Spools.

This is one of the many Rockwell batch and continuous belt or strand types—fuel fired or electric—for any gauge or quantity of wire of any metal.



Scale-free annealing of non-ferrous coiled rod in an open gas-fired, belt conveyor furnace. Also used for bright annealing certain metals.

Bulletin 418 describes various types of Rockwell furnaces for wire heating. Write for a copy.

ROCKWELL ALSO BUILDS — *Coil winding machines, reels and spools; pickling, brushing, cleaning, washing, finishing, drying and handling equipment; ovens and dryers; special fabrications; non-ferrous rod mills.*

ROCKWELL SINCE 1888 BUILT

FURNACES · OVENS · SPECIAL MACHINERY

W. S. ROCKWELL COMPANY

242 ELIOT STREET · FAIRFIELD, CONN.

In Canada: Francis Hankin & Co., Ltd. Montreal & Toronto

Brooklyn to Natrium Removal

GLYCO PRODUCTS CO., INC., is pleased to announce that all of its Brooklyn manufacturing and research facilities have been finally transferred to their main plant at Natrium, W. Va. Natrium is 85 miles southwest of Pittsburgh and 32 miles south of Wheeling.

★ ★ ★

CONSOLIDATION of these manufacturing and research facilities has resulted in more efficient and economical production. This more central location puts it in an improved position for receiving raw materials and shipping finished products.

★ ★ ★

NEW stainless steel and glass-lined equipment recently installed for the manufacture of polyoxyethylene stearates and glyceryl monostearates is of the most recent design and of sufficiently large capacity to take care of greatly expanded demands. These types of emulsifiers and stabilizers are used in the leather, metal treating, paper, rubber, paint, plastics, lubricant and other industries.

★ ★ ★

New Eisler Spot Welder

AN improved Press Type Spot Welder operated by a double acting air cylinder, engineered for dependable high speed production, has just been put on the market by the **Eisler Engineering Co., Inc.**, Newark, New Jersey.

★ ★ ★

A FEATURE of this welding machine, shown in the accompanying illustration, is the new Solenoid-actuated 4-Way Air-Valve, which controls the air supply to both sides of the air cylinder. This valve is not only simpler in its design and trouble-free in action, but is practically noiseless.

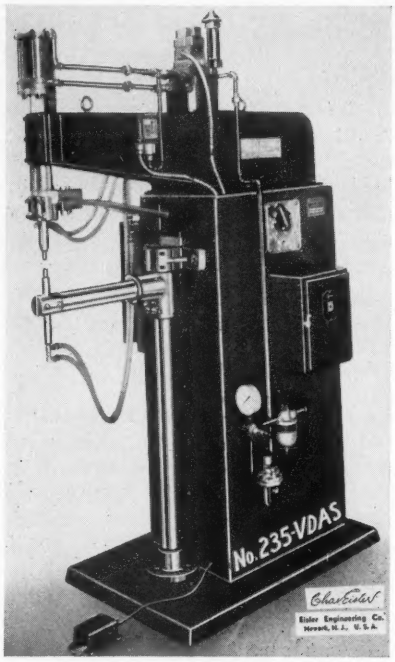
★ ★ ★

THE air system includes further an Air Pressure Regulator with indicating pressure gauge, and automatic Lubricator and an Air Filter. Electrode pressure is adjustable.

★ ★ ★

HEAT adjustment is performed by a heat regulator (7 steps on and 1 step off) with dial control, permitting to handle a wide range of materials and thicknesses. High speed magnetic contactor and weld timer control insures uniformly clean, strong welds, even in fast production.

★ ★ ★



Eisler Press Type Spot Welder.

AN electric foot switch initiates and governs the otherwise fully automatic function of the welding machine. All accessories are mounted on a solid arc welded box type steel frame, with rear door for easy inspection, entirely enclosed but amply ventilated.

★ ★ ★

THE built-in transformer is air-cooled. The electrode made of best wear resistant copper alloy of high electrical and thermal conductivity are water-cooled. Electrode holders are adjustable up to 24″ opening between arms. Repeating strokes possible up to 120 per minute.

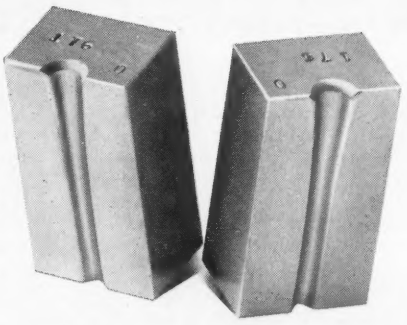
★ ★ ★

THIS type of SPOT WELDERS SERIES NO. 200 are built and available in sizes from 7.5 up to 75 KVA. Please write for, address Eisler Engineering Co., Inc.

★ ★ ★

Sjogren POINTING DIES

SJOGREN Pointing Dies have proven themselves! Made from shock-resisting, high grade steel they assure many hours of hard, continuous usage. Fit your swaging machines with these rugged, S & S Pointing Dies, made to order on your specifications, they guarantee you service.



SINCE S&S 1927

Used by Wire Men Who Want the Best!

SJOGREN TOOL AND MACHINE CO., INC.

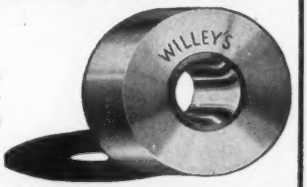
WIRE PULLERS • WEDGE GRIPS • JAWS FOR ALL MAKES OF PULLERS AND TESTING MACHINES • CAGE ROLLERS • SWAGING HAMMERS • POINTING DIES • WIRE SPOOLERS

14 SWORD STREET
AUBURN
MASSACHUSETTS

WILLEY'S DIES LAST MUCH LONGER

SPECIFY WILLEY'S SIZING, EXTRUSION and WIRE DRAWING DIES

Pioneers in the manufacture of wire forming dies, Willey's is in position to make dies to your specifications that give superior performance, cut production costs and hold tolerances for long runs.



There are standard one-piece round dies, available from stock in many sizes — as well as four classifications from blank and rough cored nibs to finished dies. ready to use.

WRITE FOR NEW CATALOG 449

Full information on all sizes and classifications, as well as hundreds of Willey's Tools for other uses.

WILLEY'S CARBIDE TOOL CO.
SOLE MAKERS OF WILLEY'S METAL
1342 W. Vernor Highway Detroit 1, Michigan

NEW — AND BETTER

PATENTING
TEMPERING
ANNEALING

The *Trauwood* PROCESS

OUTSTANDING ADVANTAGES

Higher and more uniform physical and fatigue properties.

No surface decarburization or scale.

Faster wire speeds . . . greater production.

Equipment fully automatic and easy to operate.

Control of heating and cooling cycles extremely accurate.

Thermal efficiency of the process very high.

Much finer grained structure possible.

High quenching temperatures rapidly attained.

Adaptable to high alloy and austenitic steel wire and strip (annealing of stainless).

The Trauwood Process, new in principle, eliminates high temperature furnaces and lead pots with their excessive maintenance costs and low thermal efficiencies. More positive temperature control is possible and quenching is done in a RISING temperature—instead of falling, as in conventional heat treating methods. The rapid rate of heating (4 to 5 times as fast as furnace heating) increases production and uniformly produces a finer grained product with higher physical and fatigue values.

Wire and rod patented by the Trauwood Process insures easier drafting and makes heavier reductions possible. In conjunction with the Trauwood patenting equipment, pickling, coating and baking can be made continuous, eliminating expensive handling and delay, materially reducing costs as compared with ordinary methods.

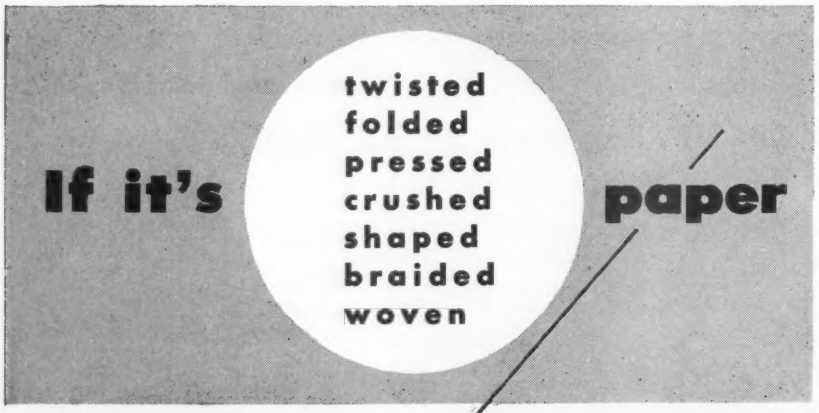
Complete details of the Trauwood Process will be furnished you on request. Our engineers will help you solve your continuous wire and strip patenting, tempering, and annealing problems. Write today.

THE TRAUWOOD ENGINEERING COMPANY

15200 BROOK PARK RD., Box 2719, Westpark Station, CLEVELAND, OHIO

British Representative:

JOHN RIGBY & SONS, LTD., LOW MOOR, BRADFORD—YORKS, ENGLAND



TWITCHELL makes it

treated braiding and wrapping yarns wound single or multiple ends parallel for new high-speed Abbosealed process or standard braiding equipment.

treated wire-rope cores

waxed cable-fillers for 2- and 3-wire non-metallic sheathed cable and shipboard cable, etc.

E. W. TWITCHELL INC.

Third & Somerset Streets

Philadelphia 33, Pa.

"Air Conditioning"

A BOOK by Herbert Herkimer, Consulting Engineer and Past Director of the Herkimer Institute of Mechanical Trades, and Harold Herkimer, Design Engineer and Project Manager of the Raisler Corp., has been published by the Chemical Publishing Company, Brooklyn, N. Y.

★ ★ ★

THE book, contains 692 pages of information for engineers interested in the subject. It covers all phases of air conditioning, including estimation, sales, promotion, installation, supervision and service. It reviews the laws of chemistry and physics associated with air conditioning and will be of help to technical men who want to design new equipment or to repair old. Many tables and problems with their solutions are included.

★ ★ ★

WITH more and more attention being given by wire mills to air conditioning and ventilation, it should be a practical addition to mill libraries.

★ ★ ★

"AIR CONDITIONING" sells for $12.00 and may be ordered through **Wire and Wire Products.**

Multi-Outlet Strip for Laboratories

THE new Multi-Outlet Strip by **Eberbach** provides 6 electrical outlets conveniently spaced 6" apart on a thin metal case; a rubber-covered cord and plug connects to permanent outlet.

★ ★ ★

THE M-O Strip is for use wherever additional electrical outlets are required. It is particularly useful in commercial and educational laboratories to eliminate the tangle of wires resulting from use of several multiple plugs at a single outlet; it eliminates the necessity for additional permanent wiring.

★ ★ ★

LITERATURE showing the Multi-Outlet Strip in use is available to our readers upon request.

★ ★ ★

Du Pont to Build New Plant

ARNOLD E. PITCHER, general manager of the **DuPont Company's Plastics Department,** has announced that the company will build a new unit at its Washington Works, near Parkersburg, W. Va., for the first full-scale manufacture of its plastic, "Teflon" tetrafluoroethylene resin.

★ ★ ★

CONSTRUCTION will be started in the late Spring or early Summer of this year and the work will be finished in about twelve months, Mr. Pitcher said.

★ ★ ★

DU PONT for some time has been producing "Lucite" acrylic resin, nylon and polythene plastics at the Washington Works. "Teflon" is now being made in a small semi-works at Arlington, N. J.

★ ★ ★

"'TEFLON' is one of the most unusual plastics I have seen developed in my 40 years with the plastics industry," Mr. Pitcher said. "It has a combination of properties unmatched by other organic materials. Industrial research during the last six years developed enough improved products using 'Teflon' to require expansion of our capacity to manufacture it."

★ ★ ★

LABORATORY investigation and experimental use of the plastic by industry have shown the following properties of "Teflon" to be outstanding:

1. The ability continuously to withstand temperatures from 550 to 575 degrees F., or, for example, higher than oven temperatures used for baking in the home.
2. Resistance to all acids including those that will dissolve gold and platinum.
3. Electrical properties that make it a superior insulating material at high frequencies where heat resistance also is vital.
4. Non-adhesive properties that, in some instances, make it better than polished metal for handling sticky materials.

BECAUSE "Teflon" combines good electrical properties with resistance to temperatures that "burn out" other insulation, it has been possible to triple the power capacities of electric motors without increasing their size.

★ ★ ★

STEEL WIRE
by MAURICE BONZEL
Translated and Published by
KENNETH B. LEWIS
Consulting Engineer
Price $15.00 — 495 pages — 414 illustrations
Send Orders to
WIRE and WIRE PRODUCTS
300 Main Street Stamford, Conn.

WE BUY WE SELL

We Pay Highest Prices for Used Machinery
FOR SALE TEST TRANSFORMERS
5 — 5KVA Newark 0 to 5000 Volts
2 — 3KVA Davis
10 — 1KVA G. E. 0 to 2000 Volts
1 Scott Compression Tester — Complete
1200 (24x10) Mossberg Steel Reels
150 16-carrier Wardwell Braiders
All Machines Reconditioned in Our Own Shop
WIRE & TEXTILE MACHINERY INC.
P. O. BOX 436, PAWTUCKET, R. I.

Solve Reduce
WIRE DRAWING PROBLEMS
PRODUCTION COSTS
YOUR INQUIRY WILL BRING YOU FULL INFORMATION ON SOAPS AND COMPOUNDS TO SOLVE YOUR WIRE DRAWING PROBLEMS
R.H.MILLER CO., INC.
HOMER, NEW YORK
ESTABLISHED 1909
STEELSKIN
POWDERED SOAPS
METAL DRAWING SOAPS
and COMPOUNDS
REPRESENTATIVE
Industrial Engineer
R.H.MILLER CO., Inc.
Homer, New York

LEWIS TRAVEL-CUT WIRE STRAIGHTENING and CUTTING Machines

Machines for 1/16" to 3/4" rod
Round
Square
Flat
Hexagon
Ferrous and Non-Ferrous
Automatic
High Speed
Heavy Duty
LEWIS
The LEWIS MACHINE Co., 3445 E. 76 St., Cleveland, O.

WIRE FOR WEAR

CONTINENTAL STEEL CORP. STEEL CONTINENTAL WIRE KOKOMO, IND.

● IMPROVED THROUGH RESEARCH
● PROVED IN HARDEST USE

Constant improvement through research and constant proof in toughest use have established Continental as the "wire for wear." Whether the need is for wire to stand up under difficult forming operations . . . or for a special shaped wire to provide smarter-looking, longer-lasting trim . . . Continental is the wire that wins friends and holds customers. Write us at Kokomo.

CONTINENTAL STEEL CONTINENTAL STEEL CORPORATION

REELS SPOOLS

ALL SIZES

WOOD- PLYWOOD -WOOD-METAL

RETURNABLE NON-RETURNABLE

Samples and Prices on Request

DURKEE MFG. CO. PINE RIVER, MINN.

SPECIALIZED WIRE for WIRE FABRICATORS

Whatever your wire fabrication problem, there is a Cortland Brand specialized low carbon wire to help you make a better product with fewer production stops and rejects. Made with best corrosion-resisting steel from Wickwire's own mills —

All Finishes: Plain, galvanized, coppered or tinned.
All Sizes: Coils, spools, or straightened cut to length.
All Types: Stone wire, bookbinder, flat wire, etc.

Cortland BRAND
WICKWIRE BROTHERS, INC. CORTLAND, N. Y.

REELS and SPOOLS

HOWSAM SPOOL COMPANY

500 RATHBONE AVE.

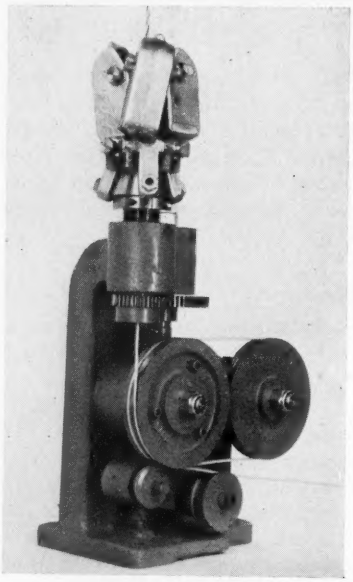
AURORA ILLINOIS

New Spiral Marking Machine For Wire Ready For Market

THE development of the first practicable spiral marking machine for color coding plastic insulated wire has been announced by the **James L. Entwistle Co.** of Pawtucket, R. I., world's largest manufacturer of wire testing equipment.

★ ★ ★

THIS machine which has long been sought by the wire industry as a means of color coding



Entwistle's New Spiral Marking Machine for Wire.

plastic insulated wire by a system of spiral stripes in one, two or three colors is now available to wire manufacturers throughout the country.

★ ★ ★

THE JLE spiral market has been thoroughly tested and rigidly conforms to the high standards set by other machines of this long-established company.

★ ★ ★

AMONG the many features of the JLE Spiral Marking Machine are:

1. It will spiral stripes up to three different colors simultaneously on plastic insulated wire or similar material.
2. Striping head is rotated by passage of wire through machine.
3. It is economical to operate. One person can handle as many as 6 machines.
4. Machine capacity is from 3/64 to .2 inches wire diameter. (Capacity to 5/16" at slight extra cost).

Warner

BELL-MINE

LIME

for

WIRE DRAWING

WARNER COMPANY

BELLEFONTE DIVISION

BELLEFONTE, PA.

Sales Office

Philadelphia—Pittsburgh—New York

5. Wire diameter adjustment is easily made.
6. Simplified cleaning and filling of ink reservoirs.
7. Wire speeds up to 200 ft. per minute are possible when proper ink drying distance or equipment is used.
8. Striping wheels are 1/32" and 1/16" wide for different widths of stripe.

TO further accommodate users of the JLE Spiral Marking Machine there is available as optional equipment at extra cost:

1. Ink Drying Tube, featuring a forced heated, spiralling air stream, is available in sectional lengths.
2. Wire Machine Stand with wire return guide sheave.
3. Motor Driven Rotator of striping head—for wires not flexible enough to bend around 4" diameter capstan wheel. Also can be used for very light wire to prevent stretching.
4. Take-Up and Pay-Off equipment.

ALL inquiries about the new machine, prices, applications and requests for other information are invited by the company. Demonstrations are now being made at the plant in Pawtucket, R. I. Samples of spiral striped wire and descriptive literature may be had by writing to the James L. Entwistle Co., 43 Church Street, Pawtucket, R. I.

★ ★ ★

SPOOLS... REELS... BOBBINS

● IF IT CAN be wound on a reel, spool or bobbin, Apco Mossberg can fill your needs.

For over 50 years we have specialized in the manufacture of spools and reels of all kinds. Our plant is equipped to manufacture almost any conceivable kind, type and size of steel spool, reel and bobbin, in large quantities or small.

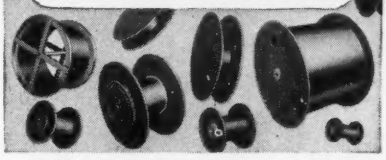
Write for our brochure containing useful information on a wide variety of our spool and reel products.

APCO MOSSBERG CO.

Attleboro, Mass., U.S.A.

Hugh Williams & Co., 47 Colborne St. Toronto, Ontario, Canada

Pacific Coast Representative, Jack P. Williams, Jr., Matson Building, 215 Market St., San Francisco 5, Calif.



EASTWOOD WIRE

CENTRIFUGALLY-CAST FOR QUALITY

Phosphor Bronze — WIRE FLAT

Nickel Silver — WIRE ROD

Eastwood-Nealley

CORPORATION

Belleville 9, New Jersey

FLUIDOX

COPPERING PROCESS

(non electrolytic)

FIXATION OF COPPER

NO SCALING!

Most important aid for

WIRE WORKS

and the best base for

ENAMELING

GALVANIZING

TINNING

RUBBER, etc.

Used in the biggest wire mills in the United States and Canada for years to their highest satisfaction. For further information write to

THE TECHEMA COMPANY

1200 Niagara Street

BUFFALO 13, N. Y., or

53 Baby Point Cresc.

TORONTO 9, Canada

Save steel! Save acid! Save money!

HAVE you tried Oakite Pickle Control No. 3 for inhibiting hot sulphuric-acid pickling?

Oakite Pickle Control No. 3 minimizes attack on steel without retarding action on scale or rust. It prevents waste of acid after scale and rust have been dissolved. It saves some customers as much as 19 cents per ton.

FREE Write today for complete information on Oakite Pickle Control No. 3.

OAKITE PRODUCTS, INC.

52A Thames Street, NEW YORK 6, N. Y.

Technical Representatives in Principal Cities of U. S. & Canada

OAKITE

REG. U. S. PAT. OFF.

Specialized Industrial Cleaning

MATERIALS • METHODS • SERVICE

VIANNEY

Famous Wire Drawing Diamond Dies

All sizes from .080 down to .00039 in stock from New York.

Appropriate profiles available for soft, medium and hard metals or to your specifications.

VIANNEY WIRE DIE WORKS
250 E. 43rd St., New York
V. J. Boulin, Manager

New Surface Plate for Toolrooms and Inspection Offered by Norton

AN entirely new ceramic surface plate was released for general sale April 1st by **Norton Company** of Worcester, Mass.

★ ★ ★

DESIGNED for use in toolrooms and inspection departments where precision setups and checking measurements require the highest degree of accuracy, this plate affords three distinct advantages: extreme wear-resistance, a precisely flat surface guaranteed to be within .0001" (one ten thousandths of an inch), and a continuously smooth surface finish.

★ ★ ★

THIS new Norton ceramic surface plate is made of one of the hardest substances known. A laboratory test recently completed shows the Norton plate life to be at least 40 times longer than the best competing type. Exhaustive field trials conducted on this plate reveal an almost complete absence of wear either to the plate itself or to gages and instruments used on it.

★ ★ ★

THESE same field trials have shown that the plate will not warp or deform, give expansion troubles, or deflect under load. Its smooth semi-glossy surface is neither slippery nor sticky and has been proven ideal for blueing.

★ ★ ★

THE precise flatness combined with the unusual smoothness of this ceramic surface plate shortens the time required to take readings on an indicator. Likewise, its accuracy permits exact duplication of readings.

★ ★ ★

THE newly developed plate is non-magnetic. It will not sweat or corrode under any atmospheric condition, and it may be cleaned easily with soap powder and water.

★ ★ ★

BALLOFFET

Diamond Dies

Skill and accuracy in manufacture with the use of selected stones make Balloffet Diamond Dies the choice of the most critical users.

IDA MEMBER INDUSTRIAL DIAMOND ASSOCIATION OF AMERICA, INC.

Large stock on hand of domestic and imported dies available for immediate shipment in sizes from .0004" to .081"

BALLOFFET
DIES AND NOZZLE CO., Inc.
6825 Adams St., Guttenberg, N. J.
Quality Diamond Dies Since 1870

BORAX

More shops are turning to this most satisfactory coating material. It is easy and safe to handle. Does not create dust nuisance.

Pins of wire which have been properly washed after the acid dip, sul coated and then coated with Borax have been satisfactorily drawn after remaining in storage for several weeks.

Borax coated wire used with proper lubricant will increase die life.

Demonstrate the effectiveness of Borax with a fair trial in your own shop as others have done.

Bulletin Submitted on Request

PACIFIC COAST BORAX COMPANY

NEW YORK • CHICAGO • LOS ANGELES

WAYNE WIRE DIES STAND FOR

in both DIAMONDS AND WORKMANSHIP

QUALITY • QUALITY • QUALITY

Highest quality dies manufactured for those who produce quality wire. Insist on the name "WAYNE" if you want long die life, high wire production, and good wire.

WAYNE WIRE DIE CO. 200 PENNSYLVANIA AVE., HILLSIDE 5, N. J.
Phone ELizabeth 2-2456 For Prompt Service

DIAMOND DIES .0006 - .120 DIAMOND POWDER
INDUSTRIAL
AJAX
SUPPLIES INC.
R.R. 4, P.O. Box 66, Fort Wayne, Ind.

NEW ENGLAND WIRE DIE CO.
7 Forsberg St., Worcester, Mass.
EXPERT RECUTTING
DIAMOND DIES, DIAMOND POWDERS
Eastern Representative of
Ajax Industrial Supplies, Inc.

DIAMONDS for WIRE DRAWING DIES and CUTTING TOOLS
DIAMOND POWDER UNIFORM QUALITY
CHAMPION DIAMOND COMPANY, INC. 551 Fifth Ave., New York 17

DIAMOND CARBIDE
DIES
KELLY
WIRE DIE CORPORATION
19 W. 34th St. New York

DIAMOND AND CARBIDE WIRE DRAWING DIES
RUSCH WIRE DIE CORPORATION
Croton-on-Hudson, N. Y.

DIAMOND DIES
.000's to .102
Fort Wayne Wire Die Inc.
2625 E. Pontiac St. Fort Wayne, Ind.

Wire Drawing Diamond Dies

COCHAUD
WIRE DIE CORPORATION
300 W. 56th St., NEW YORK
Tel. COlumbus 5-1340

Aluminum Wire—Section IV

(*Continued from page 497*)

this type of materials are not great. Hydrochloric acid would work.

★ ★ ★

Mr. Roebuck

HOW critical is the time lag between removal of the material from the furnace and the subsequent quench in solution heat-treatment? We have been informed that this should not exceed 20 seconds.

★ ★ ★

Mr. Lees

I IMAGINE that the 20 seconds principally refers to duralumin sheet or wire.

★ ★ ★

Mr. Chapman

THIS time lag of 20 seconds is not the maximum—it depends upon the thickness of the metal and the rate of heat dissipation. I have found that in the case of large forgings as much as 30 seconds may be taken.

★ ★ ★

Mr. Siddall

I TAKE it that a solution heat-treated alloy wire would be brittle upon age hardening. It would appear therefore, that there can be little use for wire in this condition.

★ ★ ★

Mr. Lees

SOLUTION heat-treatment places the material into a ductile condition which would be suitable for forming, but to keep it in this condition for any length of time requires refrigeration. I should imagine that it would be best for the customer to carry out the solution heat-treatment himself immediately prior to forming.

★ ★ ★

Mr. Peter Smith

IS it not possible that the annealing of alloys, of the type usually classed as non-heat-treating, may be carried out by some high frequency method on the wiredrawing machine?

★ ★ ★

CONSULTANT AND SPECIALIST
DRAWING LUBRICANTS
Hans C. Bick, Inc.
READING, PA.

COMPLETE CARBIDE SALES and SERVICE
Dies, Mandrels, Wear Parts, Tools, Knives, Quills, etc.
Eastern Carbide Corp.
909 Main Street New Rochelle, N. Y.

DIAMOND WIRE DRAWING DIES
INDIANA WIRE DIE COMPANY
314-324 E. Wallace St.,
Fort Wayne, Indiana

Diamond and Carbide
Wire Drawing Dies our specialty
HOOSIER WIRE DIE, INC.
P. O. Box 423, FT. WAYNE, IND.

DIAMOND TOOLS
by
Paul Grodzinski
PRICE $5.00

This book is concerned with industrial diamonds and other precious stones. It gives information about their production and qualities, their cutting and uses and, of course, devotes considerable space to the use and manufacture of diamond dies for wire drawing. One chapter is devoted to diamond powders.

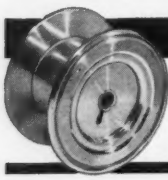
Besides being profusely illustrated, there are many reference tables providing much useful data. An effort has been made to treat every phase of the subject in a practical and helpful manner. If you are making diamond dies or tools, or using them, you cannot afford to be without this book.

You may order it from this office. Just send check or order to:

WIRE & WIRE PRODUCTS
300 Main Street Stamford, Conn.

SPECIALISTS IN
DRAWING COMPOUNDS
and
SOAP POWDERS
for
WIRE DRAWING

Established in 1906
NEIL C. POTTER
24 COMMERCE ST.
NEWARK 2, N. J.



ACROPAK
Drawn Aluminum Alloy Spools for Precision Wire Packaging
ACROMETAL PRODUCTS, INC.
604 Fifth Street North
MINNEAPOLIS 1, MINNESOTA

BOYD WIRE SPOOLERS
BOYD & SONS MANUFACTURING CO.
1434-38 Callowhill Street
Philadelphia 30, Pa.

CLEVELAND TRAMRAIL
Division of
THE CLEVELAND CRANE & ENGINEERING CO.
WICKLIFFE, OHIO
Leading manufacturers of
OVERHEAD MATERIALS HANDLING EQUIPMENT
for the Wire and Wire Products Industry

METAL PICKLING EQUIPMENT
(Acid-Resisting)
Hairpin Type
Wire Pickling Yokes
CLARK E. GORDON, INC.
8-165 General Motors Building,
Detroit 2, Michigan

EISLER TRANSFORMERS
* STANDARD and SPECIAL *
AIR — OIL or WATER-COOLED
Sizes from ¼ to 400 KVA

* FINE WIRE BUTT WELDERS *
* SPOT WELDERS *
EISLER ENGINEERING CO., INC.
747 South 13th St. Newark 3, N. J.

Mr. Lees

I DO not know of any case of this method being used, although it would appear to be a definite possibility. Copper, for instance, is being treated in that way at present in America.

★ ★ ★

Institute of Metals Notes

THE Institute of Metals Medal (in platinum) for 1949 has been awarded to **Dr. William Hume-Rothery,** F.R.S., in recognition of his outstanding contributions to the science of non-ferrous metallurgy. The President will present the medal at the Annual General Meeting of the Institute in the Hall of the Institution of Mechanical Engineers' on the morning of Wednesday, March 30, 1949. The medal is placed at the disposal of the Council of the Institute, annually, by The Mond Nickel Co., Ltd.

★ ★ ★

THE 1949 Autumn Meeting of the Institute of Metals will be held in Paris in September. The dates have not yet been definitely fixed, but further particulars will be published at an early date.

★ ★ ★

A REVISED Contents List of Publications of the Institute of Metals (Miscellaneous Publication No. 4) has just been issued, price 3s.6d., post free, to non-members and 1s.9d., post free, to members. This 57-page booklet lists, volume by volume, the contents of the 74 volumes of the "Journal" issued from 1909 to 1948, inclusive, and has an author index. It will be found to be a quick means of reference to the papers published by the Institute.

★ ★ ★

AT their laboratories in New York City facilities are maintained for both outside and inside weather testing. Outside testing racks are set up on the roof of their building while in the laboratory simulated weather conditions are secured by up-to-date equipment.

★ ★ ★

SLEEPER & HARTLEY, Inc.
Designers and Builders
SPRING COILERS
WIRE WORKING MACHINERY
WIRE MILL EQUIPMENT
SPECIAL MACHINERY
Address Inquiries to
Box 1249
WORCESTER, MASS.

FOR YOUR SPOOLS AND REELS
Patented all-steel electro-welded Drawing and Annealing and patented metal-bound shipping spools and reels.
Hubbard Spool Company
1624 Carroll Avenue, Chicago, Illinois

WATER PROOF and CREPE PAPER
in rolls of any size for wrapping coils and reels.
CREPE-KRAFT BARREL LINERS
THE CREPE-KRAFT COMPANY
Division of National Waterproof Papers Inc.
Camden, N. J.

WIRE and PROCESS MACHINERY
Custom Machinery Engineered to Suit Requirements of User.
HUGHESVILLE MACHINE & TOOL CO.
Hughesville, Penna.

RUESCH
Machinery For
Wire, Tube, and Brass Mills
409 Mulberry Street, Newark, N. J.

Annealing Pots and Boxes
Galvanizing Kettles
Lead and Spelter Pans
Pressure Vessels
National Annealing Box Co.
Established 1895
Washington, Penna.

INTERPRETATION of reports on all weather tests are made by the engineering staff in the laboratories in New York. Materials and products tested, vary widely. Amongst them are paints, enamels, surface coatings of metals, plastic materials, etc.

★ ★ ★

BETTER BUILT
Spring Coilers
14 Models
Wire ranges .003" to .750"
Mill Equipment
Gang Slitters
Flat Wire Mills
Tube & Rod Straightener
The TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONN.
MORE ACCURATE

NEP · SUMFOAM
ACID INHIBITOR • PICKLING COMPOUND
THE WM. M. PARKIN CO.
HIGHLAND BLDG. PITTSBURGH 6, PA.

Specify SAUEREISEN
ACIDPROOF CEMENTS—COMPOUNDS
FOR
Tanks, Sewers, Stacks, Floors
Technical cements for all purposes.
Send sketches or samples
Sauereisen Cements Company · Pittsburgh 15, Penna.

LANOLIN
RUST PREVENTIVES
AMERICAN LANOLIN CORPORATION
Lawrence, Mass.

ZINC WIRE
THE PLATT BROS. & CO.
Waterbury, CONN.

WIRE DRAWING MACHINERY AND EQUIPMENT
Rod Frames — 16" Frames, 8" Frames — Take-Up Frame, Wire — Pointers — Puller Tongs. — General and heat resisting alloy castings for wire mill use.
Circulars on Request.
E. J. SCUDDER FOUNDRY & MACHINE CO.
TRENTON, N. J.

THE MONTGOMERY COMPANY
Established 1871
25 CANAL STREET
WINDSOR LOCKS, CONN.
BARE ELECTRIC TINSEL CONDUCTOR and RESISTANCE TINSEL CORDAGE • TINSEL LAME • DECORATIVE TINSEL THREADS, CORDS, LAMINETTES

A Mechanical Test to Measure the Workability of Wire

(*Continued from page* 493)

be noted that the friction between the wire specimen and the yoke will vary slightly depending upon the material of the yoke and the condition of the working surfaces. The size of the hole used in testing a certain size of wire is extremely critical; but if the size of the hole is maintained constant for all wires of the same nominal size, then the values obtained from the test will be true measures of the comparative workability of the wires.

★ ★ ★

THE values of crimp sensitivity obtained from the test are naturally dependent upon the composition of the wire, and this factor should not be overlooked when comparing wires of different materials. All wire specimens should, of course, be straight.

★ ★ ★

IF mathematical analysis of such a test is to be feasible, then the span between the pillars must be some multiple of the diameter of the wire tested. A span of eight times the wire diameter was selected for this test because that is the lowest convenient multiple of four times the wire diameter. Four times the wire diameter is a figure derived from geometrical analysis of the maximum bending that a wire receives when woven into wire cloth.

★ ★ ★

SIMILARLY the deflection of the beam of wire must be a multiple of the diameter of the wire being tested if mathematical analysis of the test is to be effected. The deflection of the center of the beam of wire was set at four times the wire diameter because that amount of deflection approximates the sharpest bend that is given to wire in the processes of weaving wire cloth. Furthermore, a ninety degree bend is a convenient angle to reproduce and to measure.

★ ★ ★

MUSIC WIRE
For Mechanical Purposes
Plain Polished, Tinned, Straightened and Cut Lengths
Fine Sizes — Special Wires — Strands and Cables — Spooled and Coiled Wires

Aluminum	Pure Iron
Annealed	Pure Nickel
Brass	Resistance
Copper	Stove Pipe Wire
Florists	Stainless
Monel	Straightened and Cut
Music Wire	Tag Wire
Nickel Silver	Trolling Wire
Oil Tempered	Leader Wire
Phosphor Bronze	
Picture Wire	

THE MALIN & CO.
2514 Vestry Ave., Cleveland 13, Ohio

'Surface'
HEAT TREATING FURNACES
For Ferrous and Non-Ferrous Wire.
Prepared Atmosphere Generators.
SURFACE COMBUSTION CORPORATION
TOLEDO 1, OHIO

WOOD REELS and SPOOLS
AMERICAN WOODWORKING COMPANY
1" to 60" Diameters
OVER 50 YEARS EXPERIENCE
1674 No. Lowell Avenue
Chicago, Ill.

ROD BAKERS.....
Speedy - Modern - Uniform - Easy Loading - Economical.
Write or phone for information.
DRYING SYSTEMS, INC.
1810B - Foster Av., Chicago 40, Ill.

Wire Drawing Machines.
Galvanizing & Tinning Installations.
Wire Flattening Mills.
Spooling Machines.
STEEL EQUIPMENT CO.
2890 East 83rd Street
Cleveland 4, Ohio.

WORLD'S LARGEST MANUFACTURER
SPIRAL WRAPPING MACHINES
For Coils or Straight Lengths
Terkelsen Machine Company
323 A Street, Boston 10

SEND IN
YOUR ORDER NOW
for the
1949 WIRE BUYERS
GUIDE

LANCASTER, ALLWINE & ROMMEL
REGISTERED PATENT ATTORNEYS
Suite 438, 815—15th St., N. W.
Washington 5, D. C.

Patent and Trade-Mark Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions.
Booklet and form "Evidence of Conception" forwarded upon request.

KENNETH B. LEWIS
CONSULTING ENGINEER
Wire Mill Equipment, Layout and Practice
43 Midland St., Worcester, Mass.
Phone: Worcester 5-6033

SPRING CONSULTANTS
Design, Materials, Applications, Heat Treatment. Manufacturing, Looping, Coiling and Forming Tools, Surveys, Factory Layout.
THE CARLSON COMPANY
277 Broadway New York 7, N. Y.
BArclay 7-2552

THE WALLACE G. IMHOFF CO.
Consultants in Zinc Coating
(Hot Galvanizing)
Hot Dip Tinning — Hot Lead Coating
905 SOUTH BEDFORD STREET
LOS ANGELES 35, CALIFORNIA

FATIGUE OF MATERIALS LABORATORY
PRINCETON, N. J.
Box 367
Corrosion-fatigue testing of wire a specialty.

EDWARD J. P. FISHER
METALLURGICAL ENGINEER
CONSULTANT TO THE WIRE INDUSTRY
PLANT . RESEARCH . DEVELOPMENT . CONTROL
Box 56 . NORTH JACKSON, OHIO . TEL. 2171

WIRE WORKING MACHINERY
"Offered for Prompt Shipment"
WATERBURY-FARREL Continuous Wire Drawing Machines No. O Sleeve Type, Motor Driven with A. C. Motors, ¼" Cap. and Down, also others.
WATERBURY & MANVILLE Cold Headers and Thread Rollers.
NILSON & BAIRD Nos. 00, 0, 1, 2, 3 and 4 Four-slides.
U. S. TOOL Nos. 22, 25 and 33 MULTI-SLIDES.
SLEEPER & HARTLEY Nos. 1, 2, 3, 3½, 4 and 5 Universal Coilers.
TORRINGTON Nos. W11 & W205 Universal Coilers (some with Torsion Attachment).
LEWIS & SHUSTER Round and Shaped Wire Automatic Straightening and Cutting Machines.
NATIONAL MACHINERY EXCHANGE
128-138 MOTT ST. NEW YORK, N. Y.

Conclusions

THE transverse crimp sensitivity test is a simple, direct method for determining the quality and workability of wires of many sizes, grades, and compositions. Results of the test have been confirmed and substantiated by tensile, hardness, and metallographic data, as well as by production data. The test has been an invaluable tool in the laboratory in investigating and distinguishing between wires of superior and inferior workability. It is being used today in the Metallurgy Department of the Missouri School of Mines and Metallurgy in investigating wire of doubtful quality.

★ ★ ★

WITH minor alterations, the test is readily adaptable as a factory acceptance test for certain sizes of wire. The test gives a direct and dependable measure of the workability of wire. Such a test can eliminate many of the delays caused when faulty or improperly selected wire performs badly in fabrication. By removing the cause, such a test can eliminate most of the losses involved when a product is spoiled and scrapped because of a few strands of faulty wire.

★ ★ ★

Acknowledgments

The authors are greatly indebted to the management and workers of The Ludlow-Saylor Wire Company for their guidance and assistance in developing this test. Thanks are also due to Dr. A. W. Schlecten of the Missouri School of Mines and Metallurgy for his suggestions with regard to this paper.

★ ★ ★

A. S. & W.'s American Works Gets Safety Award

A CLEVELAND plant of **American Steel & Wire Company,** which has rolled up a record of more that 3,000,000 man-hours worked without a lost-time accident, was honored by the National Safety Council at a ceremony recently.

★ ★ ★

THE Council's Distinguished Service Award was presented on Wednesday, March 30, to the Wire Company's **American Works,** 1230 Marquette Road, Cleveland. The presentation was made by Judge Lee E. Skeel, president of the Greater Cleveland Safety Council, representing the National Council, to H. W. Hartman, superintendent of the plant.

★ ★ ★

SPECIAL recognition was given at the ceremony to the six members of the joint labor-management safety committee at the plant. Chairman of the committee is R. D. Cross, supervisor of safety and works protection. Other members are F. G. Mog, master mechanic; F. A. Kearns, superintendent of fine wire; and three labor representatives, all officers of Local 1519 United Steelworkers-CIO: Harry Marsh, treasurer; Howard Harbaugh, Jr., vice-president and grievance committeeman; and James Collingwood, recording secretary.

★ ★ ★

ALSO participating in the ceremony were A. J. Hoyt, Cleveland district manager of operations, and E. O. Kumler, the Company's assistant director of industrial relations, in charge of safety.

★ ★ ★

FOR SALE
1 new Medart Type O.A. Straightener—Capacity ⅛" dia. to 1" dia.—Roll opening to 1½". Complete with alternate set of rolls. B/P and Photo available with specifications. Reply Postal Station "R," Toronto 17, Ontario.

FOR SALE
1 10 ft. Wellman Galusha and 1 8 ft. Dover Galusha Gas Producer. Complete and in first class condition. Now operating.
WORCESTER WIRE WORKS
70 James Street
Worcester, Massachusetts

Tungsten Wire, .001" and .018." 100,000 meters.
RCA Dowmo JX and H metal Wire, .002" to .004." Over 600,000 meters.
Kovar Wire, .03." 25 lbs.
Cable, pyrometer type PBLW-4. 14 coils 250' ea.
Bridge Wire, Tophet C .0004." 4450 ft.
Berth Hooks, 140,000. Made of 3/16" stainless.
RALL SUPPLY COMPANY
1207 Virginia Avenue
Bronx 60, N. Y.

Index to Advertisers

A

Acrometal Products, Inc. 544
Aetna Standard Engineering Co. 532
Ajax Electric Company 526
Ajax Industrial Supplies, Inc. 543
Aluminum Company of America 479
American Chemical Paint Company 524
American Insulating Machinery Company 533
American Lanolin Corporation 545
American Steel & Wire Company 473
American Woodworking Company 545
Angier Corporation, The 532
Apco Mossberg Company 541

B

Balloffet Dies & Nozzle Co., Inc. 542
Bethlehem Steel Company 471
Bick, Hans Co., Inc. 543
Blashill, Arthur 520
Boyd & Sons Manufacturing Co. 544
Bridge Mfg. Co., Inc. 515

C

Carboloy Company, Inc. 469
Carl-Mayer Corporation, The 531
Carlson Company, The 546
Champion Diamond Company, Inc. 543
Cleveland Tramrail Division of the
Cleveland Crane & Engineering Co. 544
Cochaud Wire Die Corporation 543
Continental Steel Corporation 540
Crepe-Kraft Co., The
Division of National Waterproof Papers, Inc..... 544

D

Durant Mfg. Co. 535
Durkee Mfg. Co. 540
Drying Systems, Inc. 545

E

Eastern Carbide Corp. 543
Eastern Nail Company 529
Eastwood-Neally Corporation 541
Eisler Engineering Co., Inc. 544
Electric Furnace Company ..... Back Cover
Emory, Robert J. Company 536
Engis Equipment Company 517
Entwistle, James L. Co. 490

F

Fatigue of Materials Laboratory 546
Fisher, E. J. P. 546
Fort Wayne Wire Die, Inc. 543

G

Glader, Wm., Machine Works 516
Gordon, Clark E., Inc. 544

H

Haveg Corporation 534
Hoosier Wire Die, Inc. 543
Howsam Spool Company 540
Hubbard Spool Company 544
Hudson Wire Co. 476
Hughesville Machine & Tool Company 544

I

Imhoff, Wallace G. Co., The 546
Indiana Wire Die Company 543
Industrial Ovens, Inc. 474
International Nickel 480

J

Johnson Steel & Wire Company, Inc. 531

K

Kelly Wire Die Corporation 543
Keystone Steel & Wire Company 514

L

Lancaster, Allwine & Rommel 546
Lewis, K. B. 546
Lewis, Machine Co., The 539

M

Magnus Chemical Company ..... 481 and 499
Malin & Company, The 545
Metal & Thermit Corporation 534
Metal Carbides Corporation 470
Micro Products Company 513
Miller, R. H. Co., Inc. 539
Modern Plastic Machinery Corp. 533
Montgomery Company, The 545
Morgan Construction Company ..... Front Cover
Mossberg Pressed Steel Corp. 522

N

National Annealing Box Co. 544
National Machinery Exchange 546
New England Butt Company 527
New England Wire Die Co. 543
Niles Steel Products Div., Republic Steel Corp..... 489
North American Philips Co. 528
North Anson Reel Company 495
Norton Company, The ..... 482 and 529

O

Oakite Products, Inc. 541
Owens-Corning Fiberglas Corp. 472

P

Pacific Coast Borax Company 542
Parkin, Wm. M. Co., The 545
Pittsburgh Cut Wire Company 518
Platt Brothers & Co., The 545
Porter, H. K., Inc. 530
Potter, Neil C. 544

R

Robertson, John, Co., Inc. 484
Rockwell, W. S., Company 536
Roebling's, John A., Sons Company 483
Roos, Tool & Mfg. Company 535
Ross, J. O., Engineering Corp. 523
Royle, John & Sons 519
Ruesch, H. J. Machine Co. 544
Rusch Wire Die Corporation 543

S

Sauereisen Cements Company 545
Scott Testers, Inc. 530
Scudder, E. J. Foundry & Machine Co. 545
Sjogren Tool and Machine Co., Inc. 537
Sleeper & Hartley, Inc. 544
Standard Industrial Compounds Co. 485
Steel Equipment Co. 545
Surface Combustion Corp. 545
Syncro Machine Company 478

T

Techema Co., The 541
Terkelsen Machine Company 545
Torrington Mfg. Co. 545
Trauwood Engineering Co., The 538
Twitchell, E. W., Inc. 538

V

Vascoloy-Ramet Corporation 486
Vaughn Machinery Co. 475
Vianney Wire Die Works 542

W

Warner Company 541
Waterbury Farrel Foundry & Machine Co. 488
Watson Machine Company ..... Inside Back Cover
Wayne Wire Die Co. 542
Wean Equipment Corporation 521
Wickwire Brothers, Inc. 540
Willey's Carbide Tool Co. 537
Wilson, Lee, Engineering Co., Inc.. Inside Front Cover
Wire & Textile Machinery, Inc. 539

Y

Youngstown Sheet & Tube Company, The 477

WHERE TO BUY

For more complete information, consult the annual Wire and Wire Products Directory, Index & Buyer's Guide.

ABRASIVES—
Norton Co., Worcester, Mass.

ACID INHIBITORS—
American Chemical Paint Co., Ambler, Pa.
Oakite Products, Inc., New York, N. Y.
Parkin, Wm. M., Co., Pittsburgh, Pa.

ACID-PROOF CONSTRUCTION
Haveg Corporation, Newark, Del.
Sauereisen Cements Co., Pittsburgh, Pa.

ANNEALING MACHINES—Open Flame
Syncro Machine Co., Perth Amboy, N. J.

ANNEALING POTS AND BOXES—
National Annealing Box Co., Washington, Penna.
Scudder, E. J., Foundry & Machine Co., Trenton, N. J.

ARMORING EQUIPMENT—
American Insulating Mach'y. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Machy., Inc., Pawtucket, R. I.

BAKERS—Rod and Wire
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Morgan Construction Co., Worcester, Mass.
Ross, J. O., Engr. Corp., New York, N. Y.

BAR STOCK—Stainless Steel
Armco Steel Corp., The, Middletown, Ohio.
American Steel & Wire Company, Cleveland Chicago, New York.
Columbia Steel Co., San Francisco, Calif
U. S. Steel Export Company, New York, N. Y.

BOBBINS—Braider & Wire Weaving
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

BORAX—Wire Drawing
Pacific Coast Borax Corp., New York, N. Y.

BORON CARBIDE—
Norton Co., Worcester, Mass.

BRAKES—Pneumatic
Entwistle, Jas. L. Co., Pawtucket, R. I.

CABLE LACQUERING OVENS—
Industrial Ovens, Inc., Cleveland, O.

CARRIERS—Braider, High Speed
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

CASTINGS—Wire Mill
Scudder, E. J., Fdry. & Mach. Co., Trenton, N.J.

CEMENTS—Acid Proof
Sauereisen Cements Co., Pittsburgh, Pa.

CEMENTS—Refractory
Norton Co., Worcester, Mass.
Sauereisen Cements Co., Pittsburgh, Pa.

CHEMICALS—Cleaning
(See Cleaners—Metal)

CLEANERS—Metal
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Phila., Pa.
Magnus Chemical Co., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Metal & Thermit Corp., New York, N. Y.
Oakite Products, Inc., New York, N. Y.
Parkin, Wm. M., Co., Pittsburgh, Pa.
Standard Industrial Compounds Co., Inc., Chicago, Ill.

CLEANING & PICKLING EQUIP.—
Cleveland Tramrail Div., of the Cleveland Crane & Engineering Co., Wickliffe, O.
Haveg Corp., Newark, Del.
Metal & Thermit Corp., New York, N. Y.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

CLOTH TESTERS—
Scott Testers, Inc., Providence, R. I.

CLOTH—WIRE, All Metals
Roebling's, John A. Sons, Co., Trenton, N. J.
Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp., Buffalo, N. Y.

COATING COMPOUNDS—
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Inc., Chicago, Ill.

COILERS—Sheet, Strip and Wire
Entwistle, Jas. L. Co., Pawtucket, R. I.
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J. Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio.

COLD HEADERS—
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

COMPOUNDS—Coppering
American Chemical Paint Co., Ambler, Pa.
Techema Co., The, Toronto, Canada.

COMPOUNDS—Diamond
Magnus Chemical Co., Garwood, N. J.

COMPOUNDS—Metal Finishing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Metal & Thermit Corp., New York, N. Y.

COMPOUNDS—Rust Preventing
American Chemical Paint Co., Ambler, Pa.
American Lanolin Corp., Lawrence, Mass.
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Oakite Products, Inc., New York, N. Y.

COMPOUNDS—Rust Removing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Inc., Chicago, Ill.

COMPOUNDS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Bick, Hans C., Inc., Reading, Pa.
Magnus Chemical Co., Garwood, N. J.
Magnuson Products Corporation, Brooklyn, N. Y.
Miller, R. H. Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Pacific Coast Borax Corp., New York, N. Y.
Potter, Neil C., Newark, N. J.
Standard Industrial Compounds Co., Inc., Chicago, Ill.
Swift & Company, Chicago, Ill.

COPHOLDERS—Steel
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

CORROSION PREVENTIVES
Angier Corp., The, Framingham, Mass.

CRANES—Wire Mill
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CUTTING TOOLS—Carbide
Carboloy Co., Inc., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Metal Carbides Corporation, Youngstown, Ohio.
Rusch Wire Die Corp., Croton-on-the-Hudson, New York.
Vascoloy-Ramet Corp., North Chicago, Ill.
Willey's Carbide Tool Co., Detroit, Mich.

CUTTING TOOLS—Wire
Porter, H. K., Inc., Everett, Mass.

DIAMONDS—Industrial
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Champion Diamond Co., New York, N. Y.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vianney Wire Die Wks., New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND POWDERS—
Champion Diamond Co., New York, N. Y.
Eastern Carbide Corp., New Rochelle, N. Y.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND TOOLS—
Carboloy Co., Inc., Detroit, Mich.
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Carbide
(See Dies—Tungsten Carbide)

DIES—Cold Heading
Carboloy Co., Inc., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio.
Vascoloy-Ramet Corp., No. Chicago, Ill.

DIES—Diamond
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Cochaud Wire Die Corp., New York, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vianney Wire Die Wks., New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Extrusion
Carboloy Co., Inc., Detroit, Mich.
Metal Carbides Corporation, Youngstown, Ohio.
Robertson, John, Co., Brooklyn, N. Y.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Eyelet
Kelly Wire Die Corp., New York, N. Y.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.

DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

DIES—Repairs & Re-Cutting
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Carboloy Co., Detroit, Mich.
Cochaud Wire Die Corp., New York, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Wks., New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Special Shapes, Etc.
Eastern Carbide Corp., New Rochelle, N. Y.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.

WHERE TO BUY, Continued

DIES—Tantalum Carbide
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, Ohio.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Wks., New York, N. Y.

DIES—Tube Drawing
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Wks., New York, N. Y.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Tungsten Carbide
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, Ohio.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Wks., New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.
Willey's Carbide Tool Co., Detroit, Mich.

DRAW BENCHES—
(See MACHINERY—Draw Benches)

DRUMS—Flange Steel
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.

DRUMS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.
Watson Machine Co., The, Paterson, N. J.

DRYING EQUIPMENT—
Carl-Mayer Corp., The, Cleveland, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio.
Modern Plastic Machinery Corp., Lodi, N. J.
Rockwell, W. S. Co., Fairfield, Conn.
Ross, J. O., Engineering Corp., New York, N. Y.

ENGINEERS—Consulting Hot Galvanizing
Wallace G. Imhoff Co., The, Los Angeles, Calif.

ENGINEERS—Consulting Spring Design
Carlson, Co., The, New York, N.Y.

ENGINEERS—Consulting Wire Mill
Fisher, Edward J. P., North Jackson, Ohio.
Lewis, Kenneth B., Worcester, Mass.

EQUIPMENT—Insulation Testing
Davis, R. L., Elec. Co., Wallingford, Conn.
Entwistle, James L., Co., Pawtucket, R. I.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FLUXES—Soldering
American Chemical Paint Co., Ambler, Pa.

FOAM PRODUCING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Parkin, Wm. M. Co., Pittsburgh, Pa.

FRICTION PAY-OFF STANDS—
Industrial Ovens, Inc., Cleveland, Ohio.

FURNACES—Annealing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engr. Co., Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Automatic
Carl-Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio.
Surface Combustion Corp., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Brazing
Electric Furnace Co., Salem, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.

FURNACES—Bright Annealing
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Electric
Eisler Engineering Co., Newark, N. J.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engineering Co., The, Cleveland, Ohio.

FURNACES—Galvanizing Equipment
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engineering Co., The, Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Hard'ing & Temp'ing
Ajax Electric Co. Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engr. Co., The, Cleveland, Ohio.

FURNACES—Lead Melting
Electric Furnace Co., Salem, Ohio.
Robertson, John, Co., Brooklyn, N. Y.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Non-Oxidizing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Electric Furnace Co., Salem, Ohio.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Normalizing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Pot (Oil, Gas, Electric)
Ajax Electric Co., Inc., Philadelphia, Pa.

FURNACES—Resistance Heating, Strand
Trauwood Engineering Co., Cleveland, Ohio.

FURNACES—Salt Bath
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corporation, Toledo, O.
Trauwood Engineering Co., The, Cleveland, Ohio.

FURNACES—Wire, Strip & Sheet
Carl-Mayer Corp., The, Cleveland, Ohio.
Eisler Engineering Co., Newark, N. J.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corporation, Toledo, O.
Trauwood Engineering Co., The, Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

GALVANIZING EQUIPMENT—
Steel Equipment Co., Cleveland, Ohio.
Wean Equipment Corp., Cleveland, Ohio.

GALVANIZING KETTLES—
National Annealing Box Co., Washington, Penna.

GRINDERS—Roll
Norton Co., The, Worcester, Mass.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HOISTS—Electric Travelling
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, Ohio.

HOOKS—Pickling and Liming
Gordon, Clark E., Detroit, Mich.
Youngstown Welding & Engineering Co., Youngstown, Ohio.

INHIBITORS—Pickling
American Chemical Paint Co., Ambler, Pa.
Oakite Products, Inc., New York, N. Y.
Parkin, Wm. M., Co., Pittsburgh, Pa.

INSULATING LACQUERING SYSTEMS—Continuous
American Insulating Machine Co., Phila., Pa.
Industrial Ovens, Inc., Cleveland, Ohio.

INSULATING MATERIALS—
Du Pont de Nemours, E. I., Co., Wilmington, Del.
Martin, Glenn L., Company, Baltimore, Md.
Owens Corning Fiberglas Corp., Toledo, O.
Twitchell, E. W., Philadelphia, Pa.

LATHES—Die Reaming
Carboloy Co., Inc., Detroit, Mich.
Morgan Construction Co., Worcester, Mass.
Roos, Tool & Mfg. Co., Montclair, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Machine Co. Waterbury, Conn.

LIME—
Warner Co., Philadelphia and Bellefonte, Pa.

LININGS—Acid and Alkali Proof
Haveg Corp., Newark, Del.
Sauereisen Cements Co., Pittsburgh, Pa.

LUBRICANTS—For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Inc., Chicago, Ill.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUMBER—Wire Mill, for lagging and car blocking.
North Anson Reel Co., North Anson, Maine

MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Bead Wrapping
Terkelsen Machine Co., Boston, Mass.

MACHINERY—Braiding
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

MACHINERY—Brazing
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Bunching
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Bundling, Scrap
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Chain Making
Nilson, A. H. Machine Co,, The, Bridgeport, Conn.

MACHINERY—Cable, Rope Closing
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Coil Winding
Boyd & Sons Manufacturing Co., Phila., Pa.
Rockwell, W. S., Co., Fairfield, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.

WHERE TO BUY, Continued

MACHINERY—Coilers
Boyd & Sons Manufacturing Co., Phila., Pa.
Eisler Engineering Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
Morgan Construction Co., Worcester, Mass.
National Machinery Exchange (used), New York, N. Y.
New England Butt Co., Providence, R. I.
Ruesch, H. J. Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio.
Wire & Textile Machinery, Inc., Pawtucket, R. I.

MACHINERY—Copper Wire Drawing and Rolling
Aetna-Standard Engineering Co., Youngstown, Ohio.
American Insulating Mach'y Co., Phila., Pa.
National Machinery Exchange (used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cutting
Eisler Engineering Co., Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio.
Mettler Machine Tool, Inc., New Haven, Conn.
National Mach'y Exch. (Used) New York, N. Y.
Nilson Machine Co., A. H., Bridgeport, Conn.
Porter, H. K., Inc., Everett, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Die Making
Carboloy Co., Inc., Detroit, Mich.
Kelly Wire Die Corp., New York, N. Y.
Roos, Tool & Mfg. Co., Montclair, N. J.
Wayne Wire Die Co., Hillside, N. J.

MACHINERY—Draw Benches
Aetna-Standard Engineering Co., Youngstown, Ohio.
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Edging
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Industrial Ovens, Inc., Cleveland, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Extruding
Modern Plastic Machinery Co., Lodi, N. J.
Robertson, John, Co., Brooklyn, N. Y.
Royle, John, & Sons, Paterson, N. J.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Fence
Blashill, Arthur, Woodstock, Ont., Canada.
Glader, Wm., Machine Works, Chicago, Ill.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Filament Coil Winding
Eisler Engineering Co., Newark, N. J.

MACHINERY—Flat Wire
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Galvanizing
(See Galvanizing Equipment)

MACHINERY—Galvanizing Wire
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

MACHINERY—Gang Winders
Entwistle, Jas. L. Co., Pawtucket, R. I.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Insulating
American Insulating Mach'y Co., Phila., Pa.
Modern Plastic Machinery Co., Lodi, N. J.
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lead Encasing Presses, etc.
Robertson, John Co., Brooklyn, N. Y.

MACHINERY—Lead Stripping
Robertson, John Co., Brooklyn, N. Y.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Looms, Wire Weaving
Bruckner-Mitchell, Inc., New York, N. Y.

MACHINERY—Magnet Wire
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Material Handling
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MACHINERY—Measuring Wire & Cable
Durant Mfg. Co., Milwaukee, Wis.
Entwistle, Jas. L. Co., Pawtucket, R.I.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Black Industries, Cleveland, Ohio.
Eastern Nail Co., Providence, R. I.
Glader, Wm., Machine Works, Chicago, Ill.
National Mach'y Exch. (Used), New York, N.Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Panning
American Insulating Mach'y Co., Phila., Pa.
Syncro Machine Co., Perth Amboy, N. J.
Wire & Textile Machinery, Inc., Pawtucket, R.I

MACHINERY—Pickling
Gordon, Clark E., Detroit, Mich.
Youngstown Welding & Engineering Company, Youngstown, Ohio.

MACHINERY—Pointing
Aetna-Standard Engineering Co., Youngstown, Ohio.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Mach. Co., Trenton, N.J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Rod Mill
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Rolling Mill
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Rubber Insulating
Royle, John & Sons, Paterson, N. J.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Rubber Tubing and Straining
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Screw Wire
National Mach'y Exch. (Used), New York, N.Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Special
American Insulating Mach'y Co., Phila, Pa.
Black Industries, Cleveland, Ohio.
Bruckner-Mitchell, Inc., New York, N. Y.
Eastern Nail Co., Providence, R. I.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
New England Butt Co., Providence, R. I.
Ruesch, H. J. Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Mach. Co., Trenton, N.J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Spooling
American Insulating Mach'y Co., Phila., Pa.
Boyd & Sons Manufacturing Co., Phila., Pa.
Eisler Engineering Co., Newark, N. J.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
Modern Plastic Machinery Co., Lodi, N. J.
National Mach'y Exch. (Used), New York, N.Y.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury, Conn.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

MACHINERY—Spring Making
National Mach'y Exch. (Used), New York, N.Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Lewis Machine Co., The, Cleveland, Ohio.
Mettler Machine Tool Co., New Haven, Conn.
National Mach'y Exch. (Used), New York, N.Y.
Nilson, A. H. Machine Co., Bridgeport, Conn.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Stranding
Hughesville Machine & Tool Co., Hughesville, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Strip Steel
Aetna-Standard Engineering Co., Youngstown, Ohio.
Ruesch, H. J., Machine Co., Newark, N. J.
Steel Equipment Co., Cleveland, Ohio.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Swaging
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Waterbury-Farrel Foundry & Machine Co. Waterbury, Conn.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Testing Physical
Dillon, W. C. & Co., Inc., Chicago, Ill.
Eberbach & Son Co., Ann Arbor, Mich.
Scott Testers, Inc., Providence, R. I.

MACHINERY—Testing Equipment—Sparkers
Davis, R. L. Elec. Co., Wallingford, Conn.
Entwistle, Jas. L., Pawtucket, R. I.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Steel Equipment Co., Cleveland, Ohio.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill
Ruesch, H. J., Machine Co., Newark, N. J.

MACHINERY—Welding Wire
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Winding
American Insulating Mach'y Co., Phila., Pa.
Eisler Engineering Co., Newark, N. J.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

WHERE TO BUY, Continued

MACHINERY—Wind-up (Constant Tension, Variable Speed)
Aetna-Standard Engineering Co., Youngstown, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio.
Modern Plastic Machinery Co., Lodi, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Bending
Eisler Engineering Co., Newark, N. J.

MACHINERY—Wire Drawing
Aetna-Standard Engineering Co., Youngstown, Ohio.
American Insulating Mach'y Co., Phila., Pa.
Eisler Engineering Co., Newark, N. J.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Mach. Co., Trenton, N.J.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co. Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Wire Forming
Eisler Engineering Co., Newark, N. J.
National Mach'y Exch. (Used), New York, N.Y.
Nilson Machine Co., A. H., Bridgeport, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Wire Rope
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wood Screw
National Mach'y Exch. (Used), New York, N.Y.

MACHINERY—Wrapping Straight Lengths and Tubing
Terkelsen Machine Co., Boston, Mass.

MACHINERY—Wrapping Wire Coils
Angier Corporation, Framingham, Mass.
Terkelsen Machine Co., Boston, Mass.

MATERIAL HANDLING EQUIPMENT
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MATERIAL—Resistance Heating Strand
Trauwood Engineering Co., Cleveland, Ohio.

MILLS—Tandem, Rolling & Edging
Torrington Mfg. Co., Torrington, Conn.

NAILS—Wire
American Steel & Wire Co., Cleveland, Chicago, New York
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling, John A. Sons Co., Trenton, N. J.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire-Spencer Steel Division of Colorado Fuel & Iron Corp., Buffalo, N. Y.
U. S. Steel Export Co., New York, N. Y.

NICKEL SILVER AND PHOSPHOR BRONZE—Rod, Wire and Strip
Eastwood-Nealley Corp., Belleville, N. J.
Hudson Wire Co., Ossining, N. Y.

OVENS—Cable Lacquering
American Insulating Mach'y Co., Phila., Pa.
Industrial Ovens, Inc., Cleveland, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.

OVENS—Dehydrogenizing
Carl-Mayer Corp., The, Cleveland, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.

OVENS—Industrial
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Industrial Ovens, Inc., Cleveland, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.
Ross, J. O., Engr. Corp., New York, N. Y.

OVENS—Welding Rod Coating
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Industrial Ovens, Inc., Cleveland, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.
Ross, J. O., Engr. Corp., New York, N. Y.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.

PANS—Lead and Spelter
National Annealing Box Co., Washington, Pa.

PANS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.

PAPER—Creped Wrapping
Angier Corp., The, Framingham, Mass.
Crepe-Kraft Company, The, Division National Waterproof Papers, Inc., Newark, N. J.
Terkelsen Machine Co., Boston, Mass.

PAPER—For Coil Wrapping and Corrosion Prevention
Angier Corporation, The, Framingham, Mass.
Crepe-Kraft Company, The, Division National Waterproof Papers, Inc., Newark, N. J.
Terkelsen Machine Co., Boston, Mass.

PAPER TESTERS—
Scott Testers, Inc., Providence, R. I.

PATENT ATTORNEYS—
Lancaster, Allwine & Rommel, Washington, D.C.

PICKLING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Oakite Products, Inc., New York, N. Y.
Parkin, Wm. M., Co., Pittsburgh, Pa.

PICKLING—Hooks, etc. Acid Resisting
Gordon, Clark E., Detroit, Mich.
Youngstown Welding & Engineering Company, Youngstown, Ohio.

PICKLING TANK LININGS—
Haveg Corp., Newark, Del.
Sauereisen Cements Co., Pittsburgh, Pa.

PIPES & FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

PLASTIC TESTERS—
Scott Testers, Inc., Providence, R. I.

PNEUMATIC CYLINDERS
Entwistle, James L. Co., Pawtucket, R. I.

POTS—Lacquer
Industrial Ovens, Inc., Cleveland, Ohio

POTS—Lead Melting
National Annealing Box Co., Washington, Pa.
Robertson, John, Co., Brooklyn, N. Y.

POWDER—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Potter, Neil C., Newark, N. J.
Standard Industrial Compounds Co., Inc., Chicago, Ill.

PRESSES—Hydraulic and Mechanical
Robertson, John, Co., Brooklyn, N. Y.

PRESSES—Lead
Robertson, John, Co., Brooklyn, N. Y.

PRESSURE VESSELS—
National Annealing Box Co., Washington, Pa.

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J., Fdry & Mach. Co., Trenton, N.J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.

PUMPS—Hydraulic
Robertson, John, Co., Brooklyn, N. Y.

REEL AND TENSION STANDS—
Davis, R. L. Electric Co., Wallingford, Conn.
Entwistle, James L., Co., Pawtucket, R. I.
Industrial Ovens, Inc., Cleveland, Ohio.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

REEL CRUTCHES—
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Drawn Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS & SPOOLS—Collapsible
Entwistle, Jas. L. Co., Pawtucket, R. I.

REELS & SPOOLS—Steel
Apco Mossberg Co., Attleboro, Mass.
Clark, J. L., Mfg. Co., Rockford, Ill.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS AND SPOOLS—Shipping and Shop
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg., Co., The, Hazardville, Conn.
Clark, J. L., Mfg. Co., Rockford, Ill.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
North Anson Reel Co., North Anson, Maine

REELS—Metal Bound
Durkee Mfg. Co., Pine River, Minn.
Hubbard Spool Co., Chicago, Ill.
North Anson Reel Co., North Anson, Maine

REELS—Takeoff
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg., Co., The, Hazardville, Conn.
Clark, J. L., Mfg. Co., Rockford, Ill.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
North Anson Reel Co., North Anson, Maine

REELS—Vulcanizing & Impregnating
Apco Mossberg Co., Attleboro, Mass.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS—Wire Drawing
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg., Co., The, Hazardville, Conn.
Durkee Mfg. Co., Pine River, Minn.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
North Anson Reel Co., North Anson, Maine

REELS & SPOOLS—Wooden
Acrometal Products, Inc., Minneapolis, Minn.
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., Inc., The, Hazardville, Conn.
Durkee Mfg. Co., Pine River, Minn.
North Anson Reel Co., North Anson, Maine

REFRACTORIES—High Temperature
Norton Company, Worcester, Mass.

RESISTANCE HEATING—Annealing, Patenting, Etc.
Trauwood Engr. Co., Cleveland, Ohio.

ROD BAKERS—
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Rockwell, W. S., Co., Fairfield, Conn.
Ross, J. O., Engineering Corp., New York, N.Y.

RODS—Nickel Alloy
Eastwood Nealley Corp., Belleville, N. J.
International Nickel Co., Inc., New York, N.Y.

RODS—Stainless Steel
Armco Steel Corp., The, Middletown, Ohio.

RODS—Wire—Non-Ferrous
Eastwood Nealley Corp., Belleville, N. J.
Hudson Wire Co., Ossining, N. Y.
Platt Bros. & Co., The, Waterbury, Conn.

RODS—Wire, Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's John A., Sons Co., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

WHERE TO BUY, Continued

ROPE—Wire
American Steel & Wire Company, Cleveland, Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Roebling's John A., Sons Co., Trenton, N. J.
U. S. Steel Export Co., New York, N. Y.
Wickwire-Spencer Steel, Division of Colorado Fuel & Iron Corp., Buffalo, N. Y.

RUBBER AND RUBBER COMPRESSION TESTERS—
Scott Testers, Inc., Providence, R. I.

RUST PROOF COMPOUNDS—
(See Compounds—Rust Preventing)

RUST REMOVING COMPOUNDS—
(See Compounds—Rust Preventing)

SATURATION SYSTEMS—
Industrial Ovens, Inc., Cleveland, Ohio.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc., Pawtucket, R. I.

SHEET—Steel
Armco Steel Corp., The, Middletown, Ohio.
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

SOAPS—Industrial and Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Bick, Hans C., Inc., Reading, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H. Co., Inc., Homer, N. Y.
Potter, Neil C., Newark, N. J.
Standard Industrial Compounds Co., Inc., Chicago, Ill.
Swift & Company, Chicago, Ill.

SOLVENT RESIN SYSTEMS—Experimental
Industrial Ovens, Inc., Cleveland, Ohio.

STAMPINGS—Steel
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRIP—Brass and Non-Ferrous
Hudson Wire Co., Ossining, N. Y.

STRIP—Steel
Armco Steel Corp., The, Middletown, Ohio.
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Roebling's, John A., Sons Co., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

SWIFTS—Take-off
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Watson Machine Co., Paterson, N. J.

TANKS—Compound
Atlas Mineral Products Co. of Pa., Mertztown, Pa.
Haveg Corp., Newark, Del.
Watson Machine Co., Paterson, N. J.

TANKS—Pickling
Haveg Corp., Newark, Del.
Rockwell, W. S., Co., Fairfield, Conn.
Sauereisen Cements Co., Pittsburgh, Pa.

TANKS—Steel
Mossberg Pressed Steel Corp., Attleboro, Mass.
Rockwell, W. S., Co., Fairfield, Conn.
National Annealing Box Co., Washington, Pa.

TINSEL—Cords, Decorative
Hudson Wire Co., Ossining, N. Y.
Montgomery Co., The, Windsor Locks, Conn.
North American Philips Co., Inc., New York, New York

TINSEL—Electric Conductor
Hudson Wire Co., Ossining, N. Y.
Montgomery Co., The, Windsor Locks, Conn.
North American Philips Co., Inc., New York, New York

TINSEL—Electric Resistance
Hudson Wire Co., Ossining, N. Y.
Montgomery Co., The, Windsor Locks, Conn.
North American Philips Co., Inc., New York, New York

TINSEL—Lame, Silver and False Gold
Hudson Wire Co., Ossining, N. Y
Montgomery Co., The, Windsor Locks, Conn.
North American Philips Co., Inc., New York, New York

TINSEL—Thread, Silver and False Gold
Hudson Wire Co., Ossining, N. Y.
Montgomery Co., The, Windsor Locks, Conn.
North American Philips Co., Inc., New York, New York

TINSEL—Thread, Decorative
Hudson Wire Co., Ossining, N. Y.
Montgomery Co., The, Windsor Locks, Conn.
North American Philips Co., Inc., New York, New York

TOOLS—Wire Cutting
Porter, H. K., Inc., Everett, Mass.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TRAVERSES—For Reels
Entwistle, James L. Co., Pawtucket, R. I.
Hubbard Spool Company, Chicago, Ill.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

TRAVERSE MECHANISMS—
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

TUBE BENDERS AND FORMERS—
Ruesch, H. J., Machine Co., Newark, N. J.

VALVES AND FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

VULCANIZERS—
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS—
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.

WELDERS—Spot and Butt
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago Ill.

WIND-UP AND UNWIND SYSTEMS—Continuous
American Insulating Mach'y Co., Phila., Pa.
Davis R. L. Electric Co., Wallingford, Conn.
Entwistle, James L., Co., Pawtucket, R. I.
Industrial Ovens, Inc., Cleveland, Ohio.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

WIRE—Aluminum
Aluminum Co. of America, Pittsburgh, Pa.
Malin & Co., Cleveland, Ohio.

WIRE—Cast
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Cold Heading
Armco Steel Corp., The, Middletown, Ohio.
American Steel & Wire Co., Cleveland-Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.
U. S. Steel Export Co., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Electric
Hudson Wire Co., Ossining, N. Y.
Malin & Co., Cleveland, Ohio.

WIRE—Enameled for Coils
North American Philips Co., Inc., New York, New York
Winsted Div. of Hudson Wire Co., Winsted, Conn.

WIRE—Manufacturers
Armco Steel Corp., The, Middletown, Ohio.
American Steel & Wire Co., Cleveland-Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div. of Colorado Fuel & Iron Corp., Buffalo, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Music
American Steel & Wire Co., Cleveland-Chicago, New York
Columbia Steel Co., San Francisco, Calif.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., Cleveland, Ohio.
U. S. Steel Export Co., New York, N. Y.
Wickwire-Spencer Steel Division of Colorado Fuel & Iron Corp., Buffalo, N. Y.

WIRE—Nickel & Nickel Alloy
Eastwood-Nealley Corp., Belleville, N. J.
International Nickel Co., Inc., New York, N.Y.

WIRE—Nickel Silver and Phosphor Bronze
Eastwood-Nealley Corp., Belleville, N. J.
Hudson Wire Co., Ossining, N. Y.
Malin & Co., Cleveland, Ohio.

WIRE—Non-Ferrous to Specification for Special Purposes
Eastwood-Nealley Corp., Belleville, N. J.
Hudson Wire Co., Ossining, N. Y.
North American Philips Co., Inc., New York, New York.
Winsted Div. of Hudson Wire Co., Winsted, Conn.

WIRE—Spring
American Steel & Wire Co., Cleveland-Chicago, New York.
Armco Steel Corp., The, Middletown, Ohio.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Indiana.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
U.S. Steel Export Co., New York, N. Y.
Wickwire-Spencer Steel Division of Colorado Fuel & Iron Corp., Buffalo, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Stainless Steel
American Steel & Wire Co., Cleveland-Chicago, New York
Armco Steel Corp., The, Middletown, Ohio.
Columbia Steel Co., San Francisco, Calif.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
U. S. Steel Export Co., New York, N. Y.

WIRE—Steel—Also Coppered Steel—Also Galvanized Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Straightening and Cutting—
Pittsburgh Cut Wire Co., Pittsburgh, Pa.
Wickwire Brothers, Inc., Cortland, N. Y.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

WIRE CLOTH—Industrial
Roebling's John A., Sons Co., Trenton, N. J.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire-Spencer Steel Division of Colorado Fuel & Iron Corp., Buffalo, N. Y.

WIRE TESTERS—
Scott Testers, Inc., Providence, R. I.

WIRE, WEAVING—Non-Ferrous
Hudson Wire Co., Ossining, N. Y.

WRAPPING PAPER—Creped
Angier Corporation, Framingham, Mass.
Crepe-Kraft Company, The, Division National Waterproof Papers, Inc., Newark, N. J.

YARNS & TAPES—
Du Pont de Nemours, E. I., Co., Wilmington, Delaware
Owens Corning Fiberglas Corp., Toledo, Ohio.
Twitchell, E. W., Philadelphia, Pa.

YARN TESTERS—
Scott Testers, Inc., Providence, R. I.

The WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON 3, NEW JERSEY, U. S. A.

WATSON

ELECTRICAL WIRE AND CABLE, WIRE ROPE AND CORDAGE MACHINERY

PLANETARY STRANDERS: Three types, many sizes, for all duties, geared or ring backturn, main rotor shaft or roller support. "Shaftless" cradles.

RIGID FRAME STRANDERS "RH." Horizontal, overhung spindle designs. Ball bearing main rotor shaft support, no support rollers.

TUBULAR STRANDERS "TH." High speed type in all sizes. Patented Boat cradles and Tungsten Carbide guide system. Rotor spool and lay head electric stops.

BUNCHERS "V." High speed, double twist, vertical designs. Minimum floor space and operating expense. Heavy duty horizontal types.

CABLERS. Planetary and high speed "HH" designs.

WATSON

CLOSERS. Planetary and high speed types for wire rope.

ARMORING MACHINES. Complete with planetary wire or metal tape heads.

JUTERS. 36 or 48 cop and to 6-inch cable passage.

SERVING HEADS. Concentric and eccentric, many designs, for threads, asbestos, etc.

TAPING HEADS. Many types and sizes. For metallic and non-metallic tapes. Eccentric, single and double-concentric. Patented uniform torque tape brake.

COMPOUND AND SATURATING TANKS. Many types and sizes.

CHALK, MICA AND OTHER POWDER APPLIERS. "Wet" and "Dry" types in a variety of designs and sizes.

CAPSTAN SECTIONS. Single tapered wheels to 10 foot dia. and double grooved types to 80 inch dia. for heaviest duty and highest haul pulls. Many sizes and designs.

LET-OFFS. Manual, mechanical, hydraulic and electric motor lift types and "Shaftless" designs to 120-inch 30-ton sizes.

GANG SPOOLERS. Table and Floor types in many sizes and designs.

REWINDERS AND COILERS. All motorized, for warehouse and shipping use.

CAPSTAN TAKEUPS. Single and in multiples.

CONTINUOUS TAKEUPS. Double reel designs, constant tension, wide speed range to cover all Continuous Vulcanizing and Plastic Extruding takeup requirements.

HEAVY DUTY TAKEUPS. "Shaftless" in many designs and sizes to 120"-50-ton. Mechanical lift, hydraulic lift, motorized lift, incline frame and other types. Line shaft, electric and hydraulic drives. Foot treadle, electric switch, pneumatic, hydraulic and mechanical controls.

TAKEUP TRANSMISSIONS. Heavy Duty, Type "D." Combines two-speed transmission, manual slack-takeup drive and multiple-disc-in-oil friction mechanism in one compact unit. Now available in three sizes.

AUTOMATIC TRAVERSES. Many sizes and arrangements. Wide lay range. Designs cover range from fine wire to 6" cable and wire rope. Fully automatic and disconnectible for manual operation. Suitable and widely used for replacement of inadequate mechanisms on older takeups.

VULCANIZERS. Cavity and Plate "Patch" units. Mechanically or pneumatically operated. Available with or without dies.

POLISHERS. Power driven, centrifugal and spring-pressure types.

TESTING MACHINES. Impact, Torsion, Bend and Endurance types.

MEASURING MACHINES. For linear measurement. Offered in a variety of sizes and arrangements.

REEL CRUTCHES. For turning very large and heavy reels. Widely used in warehouses, shipping rooms, by railroads, steamship lines and wherever reel handling is a problem. Available from stock.

REELS AND SPOOLS. Cast Steel and Fabricated designs for extremely heavy planetary and shipping use.

CABLE PLANT AND WIRE ROPE MILL EQUIPMENT. All manners of special and miscellaneous designs for general and special purpose work too numerous for listing but on which inquiries are invited.

SCALE-FREE ANNEALING NICKEL-SILVER AND ALLOY WIRE

● The installation view above shows another interesting EF gas-fired recuperative radiant tube special atmosphere continuous roller hearth furnace. This equipment clean and scale-free anneals nickel-silver and other alloy wire in coils—handles 700 lbs. of wire per hour, in coils up to 30" in diameter, weighing from 65 to 85 lbs. each.

The EF combustion type generator for producing the special protective atmosphere and the desulphurizing unit for removal of hydrogen sulphide from the combustion atmosphere before introducing it into the furnace, are shown at the left.

EF furnaces are built in many different types, for performing a wide variety of heat treating processes. Sizes to meet any production requirement – gas-fired, oil-fired, or electrically heated, whichever is best for your particular problem,—and location. No installation is too large or too unusual for EF engineers. Let us work with you on your next furnace problem.

EF

GAS-FIRED
OIL-FIRED
and ELECTRIC

FURNACES

for

- AGING
- ➔ ANNEALING
- BRAZING
- CARBON RESTORATION
- CARBURIZING
- CERAMIC DECORATING
- DRAWING
- HARDENING
- HOMOGENIZING
- MALLEABLIZING
- NORMALIZING
- NITRIDING
- SINTERING
- SOLUTION TREATING
- ➔ SPECIAL ATMOSPHERE TREATMENTS

EF

THE ELECTRIC FURNACE CO.

GAS FIRED, OIL FIRED AND ELECTRIC FURNACES
FOR ANY PROCESS, PRODUCT OR PRODUCTION

WILSON STREET
Salem - Ohio